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STUDY ON PROJECTIVE MOTION IN A SASAKIAN RECURRENT AND SYMMETRIC SPACES

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ABSTRACT
Yano (1965), studied on Differential Geometry an Complex spaces. Lal and Singh (1971), studied and defined on Kaehlerian space with recurrent Bochner Curvature tensor. Negi and Rawat (1997), studied on Projective motion in a Kaehlerian recurrent space. Further, Rawat and Silswal (2006), studied projective motion in an almost Tachibana recurrent space.

In the present paper, we have studied on Projective motion in a Sasakian recurrent and symmetric spaces. Several Theorems also have been established and proved therein.

Keywords: Lie Derivative, Projective motion, Projective Curvature Tensor, Sasakian Recurrent space, Sasakian Symmetric space.

1. INTRODUCTION

An n- dimensional Sasakian space S_n^c (or, normal Contact metric space) is a Riemannian space which admits a unit Killing vector field η_i satisfying okumura [4]

$$\nabla_i \nabla_j n_k = n_j g_{ik} - n_k g_{ij} \quad \ldots (1.1)$$

It is well known that the Sasakian space is orientable and odd dimensional. Also, we know that an n – dimensional Kaehlerian space is a Riemannian space, which admits a structure tensor field F_i^h satisfying Yano [1965]

$$F_j^h F_h^i = -\delta_j^i , \quad \ldots (1.2)$$

$$F_{ij} = -F_{ji} \ , \ (F_{ij} = F_i^a g_{aj}) \quad \ldots (13)$$

and $F_{i,j}^h = 0$ … (1.4)

Where the comma (,) followed by an index denotes the operator of Covariant differentiation with respect to the metric tensor g_{ij} of the Riemannian space.

The Riemannian Curvature tensor field R_{ijk}^h , is defined by

$$R_{ijk}^h = \partial_i \left\{ \begin{matrix} h \\ j\ k \end{matrix} \right\} - \partial_j \left\{ \begin{matrix} h \\ i\ k \end{matrix} \right\} + \left\{ \begin{matrix} h \\ i\ a \end{matrix} \right\} \left\{ \begin{matrix} a \\ j\ k \end{matrix} \right\} - \left\{ \begin{matrix} h \\ j\ a \end{matrix} \right\} \left\{ \begin{matrix} a \\ i\ k \end{matrix} \right\} \quad \ldots (1.5)$$

where $\partial_i = \frac{\partial}{\partial x^i}$ and $\{x^i\}$ denotes the real local coordinates.

A Sasakian space S_n^c is said to be Sasakian recurrent, if the following condition is satisfied

$$R_{ijk,a}^h - \lambda_a R_{ijk}^h = 0 \quad \ldots (1.6)$$

Where λ_a is a non-zero recurrence vector, we shall call such space * S_n^c - space.

Let us consider an n (=2m) dimensional affinely connected space S_n^c with symmetric connection

$\left\{ \begin{matrix} h \\ i\ j \end{matrix} \right\}$ where, { h, i, j, k . . . = 1, 2, 3, 4, . . n}

The geodesics $'x^h = x^h$ (t) of the space are given by

$$\frac{d^2 x^h}{dt^2} + \left\{ \begin{matrix} h \\ i\ j \end{matrix} \right\} \frac{dx^i}{dt} \frac{dx^j}{dt} = \rho\ (t) \frac{dx^h}{dt},$$

When a transformation

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$'\xi^h = f^h(\xi^v)$ … (1.7)

transform the system of geodesics into the same system, then (1.7) is called a Projective motion in A_n. The necessary and sufficient condition that (1.7) be a projective motion in A_n is that the Lie-difference of $\Gamma^h_{\mu\lambda}$ with respect to (1.7) has the form

$$'\Gamma^h_{ij} - \Gamma^h_{ij} = A^h_i \; p_j + A^h_j \; p_i ,$$

Where P_j is a covariant vector

When (1.7) is an infinitesimal transformation

i.e., $\bar{x}^h = x^h + v^h(x)\, dt$ … (1.8)

where v^h denote components of a Covariant vector and dt means an infinitesimal constant. If $\left\{ {h \atop i\ j} \right\}$ w. r. to (1.8), itself has form

$$\mathcal{L}\,\Gamma^h_{ij} = A^h_i \; p_j + A^h_j \, p_i$$

Or $$\mathcal{L}\left\{ {h \atop i\ j} \right\} = A^h_i \; p_j + A^h_j \, p_i$$ … (1.9)

where $A^h_i = \nabla_i x^h$ for a certain non – zero covariant cector F_i.

Projective Curvature tensor P^h_{ijk} of the space S^c_n is given by,

$$P^h_{ijk} = R^h_{ijk} + \frac{1}{(n+2)}\left(R_{ik}\,\delta^h_j - R_{jk}\,\delta^h_i + S_{ik}\,F^h_j - S_{jk}\,F^h_i + 2S_{ij}\,F^h_k\right)$$ … (1.10)

We have defined

$$S_{ij} = F^a_i \, R_{aj}$$

from (1.10) and the relation

$R_{ij} = R^l_{ijl}$, we can see with

$P^l_{ijl} = 0$ and $P^l_{ijk} = 0$, … (1.11)

Substitution of (1.9) into

$$\underset{v}{\mathcal{L}}\, R^h_{ijk} = \nabla_k \left(\underset{v}{\mathcal{L}}\left\{ {h \atop i\ j} \right\}\right) - \nabla_j \left(\underset{v}{\mathcal{L}}\left\{ {h \atop i\ k} \right\}\right),$$

gives

$$\underset{v}{\mathcal{L}}\, R^h_{ijk} = A^h_j \nabla_k F_i - A^h_k \nabla_j F_i + A^h_i \nabla_k F_j - A^h_i \nabla_j F_k ,$$

From which by condition, we have

$$\underset{v}{\mathcal{L}}\, R_{ij} = 0$$ … (1.12)

In view of (1.9), the Lie – derivatives of $\left\{ {h \atop i\ j} \right\}$ can be written as

$$\underset{v}{\mathcal{L}}\left\{ {h \atop i\ j} \right\} = \nabla_i \nabla_j v^h + R^h_{ijk}\, v^k$$

Equation (1.9) contains $n^2 + 2n$ unknowns v^h, $\nabla_i v^h$ and F_i.

The integrability condition of (1.9) is composed of

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$$\underset{v}{\mathcal{L}}\, P^h_{ijk} = 0 \qquad \ldots (1.13)$$

In an affinely connected Sasakian – recurrent space * S^c_n , let us try to discuss the existence of projective motion (1.8) satisfying (1.9), for this purpose, at first we have to assume the condition

$$F_{ij} = -F_{ji}\,,\ (F_{ij} = F^a_i\, g_{aj})$$

In what follows, as we shall find an important property on P^h_{ijk} holding in admitting projective motion (1.8) , from (1.7), we have

$$\nabla_a R_{ij} = \lambda_a R_{ij}\,, \text{ or } R_{ij},a = \lambda_a R_{ij}$$

Then applying this fact to (1.10), from which in view of (1.7), we can have at least the essential property on P^h_{ijk} , of the form

$$\nabla_a P^h_{ijk} = \lambda_a P^h_{ijk}\,, \text{ or } P^h_{ijk,a} = \lambda_a P^h_{ijk}\,, \qquad \ldots (1.14)$$

Definition (1.1) : If the space S^c_n satisfies the condition

$$\nabla_a R^h_{ijk} = 0\,, \quad \text{or} \quad R^h_{ijk,a} = 0\,, \qquad \ldots (1.15)$$

then it is called a Sasakian symmetric space.

Theorem (1.1) : A necessary and sufficient condition that (1.10), be a projective motion in S^c_n is that Lie-derivative of P^h_{ijk} vanish.

The projective curvature tensor of the space S^c_n is given by

$$P^h_{ijk} = R^h_{ijk} + \frac{1}{(n+2)}\,(R_{ik}\,\delta^h_j - R_{jk}\,\delta^h_i + S_{ik}\,F^h_j - S_{jk}F^h_i + 2S_{ij}\,F^h_k)$$

Now, differentiating the above equation covariantly w.r. to x^a , we have

$$\nabla_a P^h_{ijk} = \nabla_a R^h_{ijk} + \frac{1}{(n+2)}\,(\nabla_a R_{ik}\,\delta^h_j - \nabla_a R_{jk}\,\delta^h_i + \nabla_a S_{ik}\,F^h_j - \nabla_a S_{jk}\,F^h_i + 2\,\nabla_a S_{ij}\,F^h_k)$$

If the following condition is satisfied

$$\nabla_a P^h_{ijk} = 0$$

Then the condition

$$\underset{v}{\mathcal{L}}\,\nabla_a P^h_{ijk} = 0, \quad \text{or} \quad \underset{v}{\mathcal{L}}\, P^h_{ijk,a} = 0$$

is always satisfied. Since this is the case of symmetric space.

2. CONCRETE FORM OF PROJECTIVE MOTION

From (1.12) and (1.14), we have

$$\underset{v}{\mathcal{L}}\,(\nabla_a P^h_{ijk}) = (\underset{v}{\mathcal{L}}\,\lambda_a)\, P^h_{ijk} \qquad \ldots (2.1)$$

Introducing (1.9) into the right hand side of the following result,

$$\underset{v}{\mathcal{L}}\,(\nabla_a P^h_{ijk}) - \nabla_a(\underset{v}{\mathcal{L}}\, P^h_{ijk}) = -\left(\underset{v}{\mathcal{L}}\left\{{l \atop ai}\right\}\right) P^h_{ljk} - \left(\underset{v}{\mathcal{L}}\left\{{l \atop aj}\right\}\right) P^h_{ilk} - \left(\underset{v}{\mathcal{L}}\left\{{l \atop ak}\right\}\right) P^h_{ijl} + \left(\underset{v}{\mathcal{L}}\left\{{h \atop al}\right\}\right) P^l_{ijk}$$

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We have

$$\dot{i}\left(\nabla_a\ P^h_{ijk}\right) - \nabla_a\left(\mathcal{L}_v P^h_{ijk}\right) = -2F_a P^h_{ijk} - F_i P^h_{ajk} - F_j P^h_{iak} - F_k P^h_{ija} + A^h_a F_l P^l_{ijk}\ .$$

In View of (1.12), we obtain

$$\mathcal{L}_v\left(\nabla_a\ P^h_{ijk}\right) = -2F_a P^h_{ijk} + A^l_a F_l P^h_{ijk} - F_i P^h_{ajk} - F_j P^h_{iak} - F_k P^h_{ija}$$

In this way (2.1), is re-written as

$$(2F_a + \mathcal{L}_v \lambda_a) P^h_{ijk} = A^l_a F_l P^h_{ijk} - F_j P^h_{iak} - F_k P^h_{ija} - F_i P^h_{ajk} \qquad \ldots (2.2)$$

In (2.2) making the contraction on h = a and using the relation $P^h_{ijk} = -P^h_{ikj}$,

we have

$$(2F_a + \mathcal{L}_v \lambda_a) P^a_{ijk} = a F_a P^a_{ijk} - F_i P^a_{ajk} + F_j P^a_{ika} - F_k P^a_{ija}$$

On account of (1.11), from this result, we get the condition

$$(\mathcal{L}_v \lambda_a) P^a_{ijk} = (n-2) F_a P^a_{ijk} \qquad \ldots (2.3)$$

Multiplying both sides of (2.2) by F_h and sum over h, we can obtain

$$(2F_a + \mathcal{L}_v \lambda_a) F_h P^h_{ijk} = F_a F_h P^h_{ijk} - F_i F_h P^h_{ajk} - F_j F_h P^h_{iak} - F_k F_h P^h_{ija} \qquad \ldots (2.4)$$

Or,

$$(\mathcal{L}_v \lambda_a) F_h P^h_{ijk} = -F_a F_h P^h_{ijk} - F_i F_h P^h_{ajk} - F_j F_h P^h_{iak} - F_k F_h P^h_{ija} \qquad \ldots (2.5)$$

For n ≥ 3, (2.3) shows

$$F_h P^h_{ijk} = \frac{1}{(n-2)} (\mathcal{L}_v \lambda_l) P^l_{ijk} \qquad \ldots (2.6)$$

In order to get a special form of projective motion in a S^c_n spaces, we assume, here and here after that $F_h P^h_{ijk}$ does not vanish. In fact, if we have condition $F_h P^h_{ijk} = 0$, the vectors F_h become restricted by this condition. So the motion is specialized. So, with the help of (2.6) and neglecting the number factor (n-2), we can conclude from (2.5), that

$$(\mathcal{L}_v \lambda_a)(\mathcal{L}_v \lambda_l) P^l_{ijk} = -F_a (\mathcal{L}_v \lambda_l) P^l_{ijk} - F_i (\mathcal{L}_v \lambda_l) P^l_{ajk} - F_j (\mathcal{L}_v \lambda_l) P^l_{iaj} - F_k (\mathcal{L}_v \lambda_l) P^l_{ija}$$

that is

$$(\mathcal{L}_v \lambda_l)\left[(\mathcal{L}_v \lambda_a) P^l_{ijk} + F_a P^l_{ijk} + F_i P^l_{ajk} + F_j P^l_{iaj} + F_k P^l_{ija}\right] = 0, \qquad \ldots (2.7)$$

But from (2.2), we have

$$F_i P^l_{ajk} + F_j P^l_{iak} + F_k P^l_{ija} = A^l_a F_l P^h_{ijk} - (2F_a + \mathcal{L}_v \lambda_a) P^l_{ijk} \qquad \ldots (2.8)$$

So, (2.8) may be simplified as

$$F_a P^l_{ijk} \mathcal{L}_v \lambda_l = (\mathcal{L}_v \lambda_a) F_l P^l_{ijk}\ , \qquad \ldots (2.9)$$

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Using (2.3) and (2.6) in (2.9), we have

$$F_a = \frac{1}{(n-2)} \underset{v}{\mathcal{L}} \lambda_a \qquad (n \geq 3) \qquad \ldots (2.10)$$

In this way we a $* S_n^e -$ space $n \geq 3$ admits an infinitesimal projective motion, the motion should be of the form

$$x^h = x^h + v^h(x)\, dt\,, \quad \underset{v}{\mathcal{L}} \begin{Bmatrix} h \\ ij \end{Bmatrix} = A_i^h F_j + A_j^h F_i$$

$$F_j = \frac{1}{(n-2)} \left(\underset{v}{\mathcal{L}} \lambda_j \right)$$

Next, let us examine case, where $\underset{v}{\mathcal{L}} \lambda_j$ demotes a parallel vector $\nabla_j \left(\underset{v}{\mathcal{L}} \lambda_i \right) = 0$ operating $\underset{v}{\mathcal{L}}$ to the (1.10), we get

$$\underset{v}{\mathcal{L}} P_{ijk}^h = \underset{v}{\mathcal{L}} R_{ijk}^h$$

In case of present theory, we have $\underset{v}{\mathcal{L}} P_{ijk}^h = 0$, So, it follows that $\underset{v}{\mathcal{L}} R_{ijk}^h = 0$, but this gives is the parallel (and gradient) property of $\underset{v}{\mathcal{L}} \lambda_i$

Hence, we have the following :

Theorem (2.2) : If $\underset{v}{\mathcal{L}} \lambda_i$ demotes a parallel vector, then a S_n^e space admits a general projective motion iff $\underset{v}{\mathcal{L}} R_{ijk}^h = 0$,

We know that, in order that projective motion becomes affine motion, it is necessary and sufficient that we have $F_i = 0$, or, $\underset{v}{\mathcal{L}} \lambda_i = 0$

Consequently, we get the following theorem

Theorem (2.3) : A projective motion admitted in a $* S_n^e -$ space becomes an affine motion, in the same space it is necessary and sufficient that we assume

$$\underset{v}{\mathcal{L}} \lambda_i = 0.$$

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IMPACT OF AUTOMATION SOFTWARE IN ACCESSING LIBRARY SERVICES

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ABSTRACT
The paper examines the role of library automation process in providing library services. This study is a survey of computerized libraries of engineering colleges which are located in Chennai, Kancheepuram and Thiruvallur Districts. The study is limited to the automated libraries of engineering college libraries in particular three districts. It gives a status on the software packages used by the Engineering College libraries, and opinions of the librarians about the performance of the different modules of the software they have used. This paper also investigated the need and usefulness and features and problems of the Automation software in the current scenario.

Keywords: Library automation - Software modules - OPAC - Automation software.

INTRODUCTION
Library automation is the process of utilizing information and communication technologies to facilitate library services. The ICT has made significant changes in all spheres of human activity and has greater impact on the libraries. The growing technological development has made dynamic changes in economic, political and social values and libraries. The developed countries were the first to realize the importance of ICTs and they extended their usage in stock of knowledge, storage, retrieval and utilization of the information. Countries like India where the technology is very poor and therefore conventional pattern of information dissemination is in practice. The situation has changed after the intervention of technology development. Conditions are turning to be favorable and also the government is also paying greater importance on modernization of libraries and the library professionals are upto the mark to the modern time. (Harinarayana, 1991).

Library automation implies a high degree of mechanization of various routine and repetitive tasks to be performed by human beings. With the advent of automation, the human intervention is reduced to a great extent. The appearance of computer has greatly increased the library automation. In addition to computer advancement, telecommunication and audio-visual technologies gave way to new possibilities in information handling In India; the use of computers is limited to only some specialized libraries unlike the case of developed countries. Library automation includes use of computers and other semi-automatic devices like punched cards to reprography. These are semi-automatic because human intervention is greater in extent. So, when we talk of library automation, these days, it is principally the use of computers; associated peripheral media (magnetic tapes, disks, optical media, etc); computer based products and services in library work.

Library automation may be defined as the application of automatic and semiautomatic data processing machines (computers) to perform traditional library housekeeping activities such as acquisition, circulation, cataloguing and reference and serials control. Today “Library Automation” is by far the most commonly used terms to describe the mechanization of library activities using the computer. (Uddin, 2009).

Many activities of a library are routine in nature; a few are repetitive. Automation of these activities helps in managing the library's resources in a better way at the same time saving time, money and manpower. For example, once the bibliographic details like author, title, edition, publisher, price, ISBN number, etc are entered at the time of ordering, the same data can be used for accessioning, cataloguing (OPAC), and circulation. Other important factors associated with automation are speed, and accuracy. One can imagine the time saved in literature searches and in preparing bibliographies. Automation also offers freedom from doing repetitive and routine works as well as enables providing efficient services properly and more efficiently cutting down time and improving productivity Automation also facilitates generation of a number of reports for better decision making in the effective management of the library. Availability of various statistical and other usage reports and performance reports will ensure better appreciation from library users. For example, vendor performance analysis is possible. Subject-wise or project department-wise budget can be monitored. Circulation data can provide information on titles that are in great demand so that more copies can be procured if needed. Many current awareness services like current additions, contents of books and journals, etc can also be provided to users. (Moorthy, 2004).

Libraries have been using Information Technology in general and computer technology in particular, to automate a wide range of administrative and technical processes. Libraries have the responsibility to build

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databases, OPACs, networks and provide better services to their users. This widespread use of IT in libraries has created a profound impact on all aspects of the present library environment. Library users consist of faculty members, students and administrative staff of a College. But this study has concentrated on Librarians and collected their opinions about Library Automation Software. In this digital scenario, automation of Library is an important task for all Libraries, especially in Technical Colleges. This study analyzed the Age Group and Experience of Librarians and About the Software Modules and its performance were analyzed. The Features and Problems of Software also investigated for the identification of usage among the Librarians in engineering colleges.

LITERATURE REVIEW

Application of Information and Communication Technology in different types of libraries is found to be conducted by researchers in certain studies as understand from the following studies. Information technology has opened up new possibilities in library operations in the recent years and promised to continue to do so in future (Mortien, 1991; Ochongwu, 1994). The information and communication tools have been extensively used in all sorts of library activities such as automation, housekeeping operations, other computer enabled services, planning for library automation, creation of database, housekeeping services such as circulation desk, OPAC etc (Ibohal Singh, 1996; Yadagiri, 1999). Through ICT, the libraries are interconnected which facilitate accessing of various resources in a single point (Chopra and Mukherji, 2000). The wider application of ICT requires skills to handle and the library professionals must be technical savvy (Dhiman, 2001; Kundu and Gupta, 2002, Mange, 2002). However, the application of ICTs has certain impediments discussed various points that lead to impediments like physical resource, human resource, inertia, culture, motivation and management (Ramesh, 2003; Afonso, 2004).

Chauhan and Murthy (2004) discussed the importance of ICT on information management and revealed that due to ICT the world has become a global village and the other side of ICT is its acceleration of information explosion, which enables to manage the digital contents in a systematic order for use. Discussing digital library, Greenstone digital library, Dspace, UGC-Infonet network, the study also suggested the library professionals to wake up and gear up to meet the challenges of digital environment. **Prakash and Umesh (2004)** discussed reasons for the growth of data mining, stages of the data mining process and five major elements of data mining and its application in library and information service. In a study **Veeranjaneyulu and Narasimhulu (2004)** highlighted that computer applications in the field of Library and Information Science has been a major factor attracting the attention of the Information Professionals throughout the world. The study also discussed the application of computers to agricultural libraries, information technology infrastructure, information technology application in ANGRU Libraries, IT facilities in the Libraries. In the study of information technology- past-present and future, **Kumar (2007)** pointed out the major components of information technology like computer technology, communication technology, multimedia technology, optical technology and barcode technology in detail. The study also highlighted origin and development of information technology and discussed present trends of information technology and its impact in the society.

Saxena and Mehta (1990) in their study discussed the impact of new developments in information technologies on libraries/information professionals in the libraries/ information centre management that different modern information technologies are available for different purposes. It also discussed the role and responsibilities of information professionals that have been changed due to impact of IT and highlighted role of system analyst that has become a very useful tool in the library/information system management particularly in the computerized information system.

OJha and Sharma (2003) in their study discussed the impact of information technology on libraries and shown the changing scenario, use of computer, advances in information technology, etc. Rural population requires at least some of the tools of the information age to take advantage of knowledge. Intensive techniques involved in sustainable crop and animal husbandry can be used to get better value added for their product.

Ariefa (2009) in his study discussed the overall impact of information and communication technology on rural development and also highlighted various ICT gadgets like wireless telephone, local cable television, direct broadcast satellite, community technology centers etc. and their impact on rural development.

Bembem and Vaiphei (2009) conducted a survey on the access to digital information resources by social science research scholars of Manipur University by using a questionnaire distributed to 100 scholars in 7 Departments of the University. The study analysed about the skills and knowledge of the digital information resources of the research scholars and how they access to such resources. The ICT infrastructure available in the libraries, as the survey shows, has a great impact on the access to such resource.

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Shakuntala, Veena and Shaista (2009) discussed changes brought by information and communication technology. The study also highlighted status of library Automation in Aurangabad with special reference to Babasaheb Ambedkar Marathwada University. Usage of library software, changing scenario of Aurangabad Libraries with the use of ICT, changing role of librarian, problems of automation and benefit of automation and impact on the mission of library and library professionals were some of the important major issues discussed in the study.

NEED AND OBJECTIVES OF THE STUDY

The earlier studies shows that library automation is an important area of research in Library and Information Science. The invention and innovation in IT or ICT has given impetus to automate existing library systems around the world. The technology has successfully been used in modernizing the housekeeping operations, ICT has also enabled to provide services in automated environment. It is also indicated that library automation assessment requires a number of parameters to be dealt with. While proper planning has necessitated the automation for the libraries, interests and commitments of the authorities concerned, the skills of the library professionals to adopt the new system and their attitude towards the powers are also very much required. Infrastructure development, human resource development, selection of hardware and software requirements, areas of the library operations and functions to be automated, financial provisions, etc. are some of the key issues to be taken care of, for automating the libraries, as the review shows. Various problems in automating library systems and prospects for the same have also been explored by the researchers. Use of different methods and techniques are also observed by different researchers in their studies, which has enabled the investigator to adopt most appropriate and feasible ones for the present study. In fact, the one hundred articles collected from various sources for the present review have given us ample opportunity to understand various issues associated with automation of library and information system. This helps the investigator to understand clearly on various aspects covered in the present study. It is observed from related studies that there are few studies carried out about Engineering College Libraries and this study particularly covered the all Engineering Colleges located in Chennai, Kancheepuram, and Thiruvallur Districts of Tamil Nadu. It focused that usually all technical developments are rapidly adopted by Technical Institutes. The main reason to identify the adoption of automation technology by these colleges and also it needs to clarify the usage of automation software in Engineering College Libraries. The study focuses on adequacy and availability of the automation software. Engineering College Libraries.

OBJECTIVES OF THE STUDY

1. To examine the use of Automation software in Engineering College Libraries
2. To identify the category of Software whether Commercial or In-house Developed or some other else using in Engineering college libraries
3. To know the modules and efficiency of their performance in Engineering college libraries
4. To observe the problems of automation software faced by the librarians so far.
5. To assess the qualification and experience of the Librarians to develop their library by using adequate technology in the current scenario.

DATABASE

The opinions of Librarians were extracted by using Questionnaires and Interviews. Opinions on different issues were relating to software modules and their performance, problems of automation software and the efficiency of features and functions of the software. The questionnaires were sent to some colleges and the remaining colleges have been visited by investigator's total sample size is 140 and out of which 126 (90%) were received and filled with the relevant data requested in the questionnaire. Geographically the scope of the study is limited to engineering colleges located in Chennai, Kancheepuram and Thiruvallur Districts approved by AICTE. A five-point scale system is followed to measure for getting necessary opinions. Chi-square test is used to analyze the data. The analysis has been made by using the Statistical Packages for Social Sciences (SPSS) software.

RESULTS AND DISCUSSION

This area presents the analysis and interpretation of the data collected through Questionnaire from a sample of 126 Engineering colleges in Chennai, Kancheepuram and Thiruvallur Districts about the usage of Automation Software in Engineering College Libraries and the response rate is 90%. Collected data have been analyzed and interpreted.

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Table-1: Gender wise Distribution

S. No	Gender	No. of Respondents	Total
1	Male	74	58.73%
2	Female	52	41.27%
	Total	126	100.00%

Table 1shows the details about the gender-wise Distribution of respondents. Among the 126 respondents, the share of male respondents is 58.73% and female librarians is 41.27%. The classification reveals that the share of female librarians is at satisfactory level.

Table-2: District wise Respondents

S. No	Area	No. of Respondents	Percent
1	Chennai	3	2.38
2	Kancheepuram	81	64.29
3	Thiruvallur	42	33.33
	Total	**126**	**100**

Table 2 shows the breakup of the District wise distribution of the colleges located. 2.38% (3) colleges located in Chennai District, 64.29% (81) of colleges located in Kancheepuram Districts and 33.33% (42) of the colleges located in Thiruvallur District.

Table-3: Age Group of Respondents

S. No	Age Group	No. of Respondents	Percent
1	Below 30	21	16.6
2	31-40	63	50.00
3	41-50	29	23.02
4	Above 50	13	10.32
	Total	**126**	**100**

The above table reveals that the age group details of the respondents. It shows that 21(16.67%) of the group are below 30 years of age, 63 (50.00%) of the respondents in the age range of 31-40 years. 29(23.02%) of the respondents are in the age range of 41-50 years. It is also observed that 13(10.32%) of the respondents are in the age of above 50 years. It is noted that the age group of 31-40 is occupied the leading position.

Table-4: Experience of Librarians in years

S. No	Experience	No. of Respondents	Percent
1	Below 5yrs	21	16.67
2	5-10 yrs	56	44.44
3	11-15 yrs	38	30.16
4	above 15yrs	11	8.73
	Total	**126**	**100**

The data pertaining to Years of Experience in Library field is presented in the above table. It shows that 21(16.67%) respondents have 1-5 years' experience, 56 (44.44%) respondents have 5-10 years' experience, 38 (30.16%) respondents have 11-15 years' experience and 11 (8.73%) respondents have more than 15 years of Experience in Library Field.

Table-5: Designation of the Respondents

S. No	Designation	No. of Respondents				Total	Percent
		Male	Percent	Female	Percent		
1	Librarian	32	25.40	8	6.35	40	31.75
2	Assistant Librarian	7	5.56	5	3.97	12	9.52
3	Senior Library Assistant	21	16.67	25	19.84	46	36.51
4	Junior Library Assistant	14	11.11	14	11.11	28	22.22
	Total	**74**	**58.73**	**52**	**41.27**	**126**	**100**

The above table shows the designation-wise distribution of the sample respondents. It is observed that 40 respondents are working as Librarians and among them, 32 respondents are male librarians and 8 librarians are female. The percentage rate of Male and Female Librarians are 25.40% and 6.35% respectively and totally

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Librarians occupied 31.75%. 12 (9.52%) respondents are working as Assistant Librarians and among them 7 respondents (5.56%) are male and 5 (3.97%) respondents are Female. 46 (36.51%) respondents are working as Senior Library Assistant and among them 21(16.67%) are male and 25 (19.84%) are female respondents. 28 Respondents are working as Junior Library Assistant and they occupied 22.22%. Among these 28 respondents, 14 are male (11.11%) and the remaining 14 respondents are female (11.11%). It is noted that female occupied more position as a Senior Library Assistant.

Table-6: Category of the Automation Software using

S. No	District	No. of Respondents					
		Commercial		In-house Developed		Total	
1	Kancheepuram	73	57.94%	8	6.35%	81	64.29%
2	Thiruvallur	38	30.16%	4	3.17%	42	33.33%
3	Chennai	2	1.59%	1	0.79%	3	2.38%
	Total	113	89.69%	13	10.31%	126	100.00%

The above table shows the category of the software using in the Engineering College Libraries. It shows the district wise distribution of software category. According to the table 113 (89.69%) respondents are using commercial software, among them 73 respondents (57.94%) from Kancheepuram District, 38 respondents (30.16%) from Thiruvallur District and 2 respondent (1.59%) from Chennai district. It is observed that there are 13 respondents using In-house Developed software and among them, 8 respondents (6.35%) are from Kancheepuram District, 4 respondent (3.17%) from Thiruvallur District and 1 respondent (0.79%) from Chennai district. It is noted that the majority of the respondents using Commercial software than In-house Developed software.

Table-7: Performance of Library Automation software Modules

S. No	Software Modules	Excellent	Very good	Good	Average	Below average	Total	WAS	Std. Deviation	Rank
1	Administration	45 (35.71)	14 (11.11)	15 (11.90)	41 (32.54)	11 (8.73)	126	3.33	1.46	1
2	Cataloging	22 (17.46)	52 (41.27)	31 (24.60)	7 (5.56)	14 (11.11)	126	3.45	1.19	4
3	Circulation	41 (32.54)	15 (11.90)	51 (40.48)	12 (9.52)	7 (5.56)	126	3.56	1.20	3
4	Serial Control	29 (23.02)	47 (37.30)	39 (30.95)	9 (7.14)	2 (1.59)	126	3.73	0.95	5
5	OPAC	44 (34.92)	15 (11.90)	41 (32.54)	21 (16.67)	5 (3.97)	126	3.57	1.24	2

It is observed that 45 (35.71) respondents expressed their opinion about the Administration module of the Software in their library performed as very good. 41(32.54) respondents said about the performance is Good and 5(3.97) respondents said below average regarding its performance. 44(34.92) respondents told very good about OPAC module and 41(32.54) of the respondent said good and 5(3.97) respondents said the performance is below average about the OPAC module. Regarding circulation module 51(40.48) respondents rated as good, 41(32.54) respondents rated as Excellent and 7 (5.56) respondents said below average. Regarding cataloguing Module, 52 (41.27) respondents weighted its performance as very good, 31 (24.60) respondents rated as good. 22 (17.46) respondents rated cataloguing as average. Regarding the Serial control module, 47 (37.30) respondents rated as very good, 2 (1.59) respondents rated as below average.

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Table-8: Rating of the provided features of automation software

S.No	Featres of software	Very much Comfortable	Slightly comfortable	Comfortable	Slightly uncomfort	Very much uncomfortable	Total	WAS	rank
1	Functional Modules and Features	41 (32.54)	54 (42.86)	9 (7.14)	8 (6.35)	14 (11.11)	126	3.79	3
2	Efficient search strategy	71 (56.35)	19 (15.08)	18 (14.29)	16 (12.70)	2 (1.59)	126	4.12	4
3	Data security support	51 (40.48)	28 (22.22)	19 (15.08)	21 (16.67)	7 (5.56)	126	3.75	2
4	Support to search Union/Cooperative/Consortia Catalogues	51 (40.48)	29 (23.02)	9 (7.14)	16 (12.70)	21 (16.67)	126	3.58	1

It is observed that 41 (32.54) respondents expressed their opinion about the Functional Modules and Features of the Software in their library as very much comfort. 54 (42.86) respondents said slightly comfort,14 (11.11) respondents said very much uncomfortable. 9 (7.14) respondents told comfort and 8 (6.35) of the respondent said slightly uncomfortable about Functional Modules and Features of the Software. 71 (56.35) respondents said the search strategy of the software is very much comfort, followed by 19 (15.08) respondents expressed as slightly comfort.16 (12.70) respondent told slightly uncomfortable with search strategy of the software.2 (1.59) respondents told they felt uncomfortable regarding search strategy of the software. 51 (40.48) respondents expressed their views about Data security support as very much comfortable and 7 (5.56) respondents said very much uncomfortable. 51(40.48) respondents felt very much comfortable with Support to search Union/Cooperative/Consortia Catalogues and 9 (7.14) respondents said very much uncomfortable. It is noted that majority of the respondent felt very much comfortable with the features of the software.

Table-9: Problem faced so far with the software and indicate the level of acceptance

S.No	Problems	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Total	Mean	Rank
1	Lack of support to UNICODE standards	19 (15.08)	55 (43.65)	39 (30.95)	6 (4.76)	7 (5.56)	126	3.58	4
2	Lack of Support to Digital software and Discovery services	43 (34.13)	51 (40.48)	21 (16.67)	7 (5.56)	4 (3.17)	126	3.97	3
3	Lack of compatibility with security systems (RFID and CCTV)	24 (19.05)	41 (32.54)	39 (30.95)	17 (13.49)	5 (3.97)	126	3.33	2
4	Not suitable to the specific usage profile, constraints, current needs and future plans of library	47 (37.30)	17 (13.49)	41 (32.54)	19 (15.08)	2 (1.59)	126	3.70	1

It is observed that 55 (43.65) respondents expressed their views about the Lack of support to UNICODE standards and 6 (4.76), 7 (5.56) respondents felt disagree and strongly disagree with the Lack of support to UNICODE standards respectively. 51 (40.48) felt agree and 43 (34.13) strongly agree regarding Lack of Support to Digital software and Discovery services respectively. 4 (3.17) respondents expressed as strongly disagree with the option Lack of Support to Digital software and Discovery services. 41 (32.54) respondents felt agree and 5(3.97) respondents said as strongly disagree to the Lack of compatibility with security systems (RFID and CCTV) problem.47 (37.30) respondents felt strongly agree and 2 (1.59) felt strongly disagree with the problem of software which is not suitable to the specific usage profile, constraints, current needs and future plans of the library. It is noted that the majority of the respondents gave a Neutral opinion about the provided problems with software.

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Experience vs Software modules

Experience	Performance of Modules					
	Excellent	**Very good**	**Good**	**Average**	**Below average**	**Total**
Below 5yrs	12 7.33 (2.97)	2 2.50 (0.10)	5 6.83 (0.49)	1 3.50 (1.79	1 0.83 (0.03)	**21**
5-10 yrs	12 19.56 (2.92)	5 6.67 (0.42)	22 18.22 (0.78)	15 9.33 (3.44)	2 2.22 (0.02)	**56**
11-15 yrs	13 13.27 (0.01)	7 4.52 (1.36)	13 12.37 (0.03)	4 6.33 (0.86)	1 1.51 (0.17)	**38**
above 15yrs	7 3.84 (2.60)	1 1.31 (0.07)	1 3.58 (1.86)	1 1.83 (0.38)	1 0.44 (0.73)	**1**
Total	44	15	41	21	5	**126**

Chi-Square Summary Result

Chi-Square Calculated Value($\chi 2$)	Degrees of Freedom	Chi-Square Table Value (0.05)	P-value
21.02	12	2.58	0.05

The table value of $\chi 2$ for 12 degrees of freedom at 5% level of significance is 2.58. The calculated value of $\chi 2$ is 21.022. It is higher than the table value and hence the difference among Experience is statistically identified as significant with respect to the software module.

Age group by Technical work

Age group	Performance in Technical work					
	Excellent	**Very good**	**Good**	**Average**	**Below average**	**Total**
Below 30	5 3.67 (0.48)	6 8.67 (0.82)	7 5.17 (0.65)	1 1.17 (0.02)	2 2.33 (0.05)	**21**
31-40	6 11.00 (2.27)	34 26.00 (2.46)	14 15.50 (0.15)	3 3.50 (0.07)	6 7.00 (0.14)	**63**
41-50	8 5.06 (1.70)	9 11.97 (0.74	6 7.13 (0.18)	2 1.61 (0.09)	4 3.22 (0.19)	**29**
Above 50	3 2.27 (0.23)	3 5.37 (1.04)	4 3.20 (0.20)	1 0.72 (0.11)	2 1.44 (0.21)	**13**
	22	**52**	**31**	**7**	**14**	**126**

Chi-Square Summary Result

Chi-Square Value	Degrees of Freedom	Table Value (0.05)	P-value
11.82111.821	12	2.58	0.4601

The table value of $\chi 2$ for 12 degrees of freedom at 5% level of significance is 2.58. The calculated value of $\chi 2$ is 11.821. It is lower than the table value and hence the difference among age groups is not statistically significant with respect to technical work.

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CONCLUDING REMARKS

With the two decades of library automation system history, librarians realized the revolutionary changes needed for their Libraries. Librarians can manage the automation system without much technical help. Automated Libraries can manage all type of resources and collections effectively. They can enable their college Libraries to provide better services to their users. In the Category of Software arena, Commercial holding the first place and the Librarians should looking forward to introducing innovative services and they also should take necessary action to solve the problems they faced with automation software. Then only librarians can assure their best services to their users in the digital scenario.

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A STUDY ON IMPACT OF CLASSROOM ACTIVITIES ON STUDENTS LEARNING IN B. COM & BBA COURSE AT SARDAR PATEL UNIVERSIY

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ABSTRACT
The study examines the impact of the activity based learning approaches used for Undergraduate Level Programmed conducted at Sardar Patel University in Anand. Sample size of the study was commerce and management discipline 200 students. A self-developed pre questionnaire & post questionnaire, built up by reviewing related literature was used for data collection. The data obtained were tabulated and analyzed by applying elementary quantitative techniques such as frequencies and percentages. The responses to the Likert Scale Questionnaire were analyzed qualitatively. The findings of the study indicated that 70.26% students agree with the activity based learning is good and advanced teaching method. The result showed that activity based learning sessions have developed higher level cognitive skills such as critical thinking, evaluation skills and analytical skills among the students. it was concluded that there was a positive impact of activity- based teaching in developing intellectual skills in the students.

INTRODUCTION
Learning is an endless process, which never ends. A learning experience is any event created for the students to be able to understand the topics with case. It occupies a significant place in human life. Education may be goal oriented or it may be to get some inspiration. In simple words we can say that activity based learning means education through and from activity. Activity based learning that the educator integrates activities of some types in teaching to make students learn. In this terminology "students vigorously participate in the learning experience more willingly than sit as inactive listeners" Activity-based learning started previous in 1944 nearly World War II after a British man David Horsburgh derived to India and finally definite to settle down there.

REVIEW LITERATURE

Elvis Munyaradzi Ganyaupfu (2013)
The objective of this study was to explore the distinction efficiency of teaching methods on students' academic performance. A sample of 109 undergraduate students from the College's Department of Economic and Business Sciences was used for the education. Using the inferential statistics course, students' valuation examination scores were resulting from the internal class test arranged by the lecturer. The differential effectiveness of the three education methods on student informative performance was examined using the General Linear Model based univariate ANOVA method. The Turkey HSD post-hoc results show substantial differences on the effectiveness of the three teaching methodologies.

Chilwant K. S. (2012)
In the present project structured interactive lectures with conventional lectures as a teaching method have been compared. Students were divided into two groups, interactive lecture group and conventional lecture group. The two groups were similar in all aspects except the teaching method adopted for two groups. The groups were exposed to structured interactive lectures and conventional lectures separately. Same topics from pharmacology were taught to both the groups by using these teaching methods. Effect of these two teaching methods on students was evaluated by giving questionnaire and a MCQ test conducted on the topics covered. There was no significant difference in average MCQ marks of two groups. But the outcome of questionnaire was in favor of structured interactive lecture method. Structured interactive lectures may be better than conventional lectures as a teaching method.

Jennifer Williams, MegnaMcclure, MAL et al. (2010)
Outcome an effective teaching method for direction tutors is daunting. In this experimental study undergraduate leadership pupils' retaining of information was verified later getting leadership instruction through lecture, experiential learning, and public teaching. Consequences show lecture is an inferior technique of teaching leadership although public teaching had actual and reliable results.

Dr. Damodharan V. S. ACCA, AICWA and Mr. Rengarajan V et al. (2002)
The purpose of this learning was to estimate the traditional techniques of teaching as well as multimedia teaching and to suggest other valuable teaching techniques that can be attempted in communicating information to the pupils. Essentially teaching must contain two major components sending and getting information. Ultimately, a lecturer tries his best to inform data as the way he understood it. So, any communication

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techniques that serve this purpose without destroying the objective might be considered as innovative techniques of education. The use of innovative techniques in enlightening institutes has the prospective not only to improve teaching, but also to empower people, strengthen governance besides incite the effort to reach the human progress objective for the country.

Salwani Ismail, Dr. Nor Iza A. Rahman et al. (2014)
Teaching and learning are the two sides of a coin. Hereafter, there is a strong correlation between the approaches used in delivering the information by the lecturers and the integration of that data by the pupils. MBBS planned of FPSK, UniSZA, is distributed into two segments, preclinical (Year I and II) and medical (Year III, IV and V) phases. The main teaching and learning approaches for preclinical phase include lecture, lesson, real, problem based learning (PBL) and initial medical exposure (ECE). This cross-sectional study was conducted in July 2013 in Unisia, Malaysia. 50 respondents from preclinical phase were haphazardly selected from total 117 students to answers the questionnaire. The questionnaire was developed with wide literature review and pretested and authorized. The questionnaire has been divided into 5 sections. The data were explored using the SPSS 17.0. This study showed that 36 (72%) out of 50 respondents chose lecture as the most chosen teaching and learning method. Five (10%) out of 50 respondents chosen tutorial and 3 (6%) out of 50 respondents preferred PBL, practical and ECE respectively. None of the respondents chose Computer Assisted Learning (CAL) as a preferred technique. Possibly learning guideline of CAL is not perfect that make the session the utmost un-preferred. Majority of the undergraduates in preclinical phase preferred lecturer/teacher-centered learning session to obtain knowledge in a medical school.

OBJECTIVES OF THE STUDY

To examine the impact of activity based teaching on students learning of the B.com & BBA students of Accountancy.

METHODS OF COLLECTION

The data collected through primary sources which are questionnaire which include different questions and trends identified and necessary statistical tools are used for testing of hypothesis.

We visited different colleges like BJVM, AMCOST, CP, AIBS. The faculties and non-teaching staff also helped us in the Activity based learning; an initiative taken by us. These activities were for the students of FY B.Com., SY B.Com., TY B. Com. as well as SY BBA and TY BBA students in which we conducted a Pre Questionnaire followed by explaining the purpose of this type of activities done.

First of all, the students were divided into various groups; each group consisting of 6 members.

1. Quality Control Manager (One Student)
2. Supervisors (One Student)
3. Branch Managers (One Student)
4. Accountants (One Student)
5. Workers (Two Students Involved)

The 2 Students were made boat in large number. They were made less boat but it was qualitative boat made by the workers. It means 2 students made a boat as a worker leading role and According to the role they had played an Activity. The QC was performed by a QC manager and supervisor did the supervision on the activity. The branch manager was control or foreseen the whole departmental activity. And the accountant had written their books of account. And last but not least the worker or employee, it means, students were made a boat. For the boat making, time was given approximately 2-3 minutes. Again, 2 foreign country buyers were visited the market and the different groups sold their boat with different schemes provided like Buy one get one free but the foreigners bought a comparatively cheap and qualitative boat. That group won the activity. Then again We conducted the post questionnaire for this activity. We had selected a random student for conclude the activity.

Measuring Impact of Activity on Resul ts & Learning of Students Pre-Activity Marks of Students

Pre-Activity Marks Obtained	Frequency	Percent
0.00	25	12.8%
1.00	42	21.5%
2.00	57	29.2%
3.00	34	17.4%
4.00	22	11.3%

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5.00	9	4.6%
6.00	3	1.5%
7.00	2	2.0%
Total	193	99.0

Above table indicates marks of the students before conducting activity base learning. The minimum mark is 0 and maximum is 10. The result of students between 0 to 8. We visualize that the students got 0 marks are 12.8% whereas, students got 1 marks that is 21.5% and so on. Majority students got 1 & 2 marks. They are 21.5% & 29.2% students respectively.

Post Activity Marks of students

Post-Activity Marks Obtained	Frequency	Percent
0.00	21	10.8%
1.00	29	14.9%
2.00	31	15.9%
3.00	31	15.9%
4.00	37	19.0%
5.00	16	8.2%
6.00	14	7.2%
7.00	7	3.6%
8.00	7	3.6%

The table replicates that marks of the students after conducting Activity Base Learning. The minimum marks are 0 & maximum marks is 10. The results of the students between 0 to 9. We analyzed that the students got 0 marks are 10.8%. Whereas students got 1 marks that is 14.9% & so on. The majority students of 3 & 4 marks. They are 15.9% & 19%. Students respectively. The students who 2 & 3 marks are equal in percentage that is 15.9%.

RESEARCH METHODOLOGY

The present study is descriptive and analytical in nature. The period of this research study is one year from 2015 to 2016. The type of data used in this research study are primary which are collected from different colleges from Sardar Patel university at Anand. To collect the sample pre activity test & post activity test was conducted among the students of B.com & BBA, as they were aware about cost accounting which was the main activity that was being conducted to measure the changes in learning of students. Five colleges were selected on convenient basis.

FORMULATION OF HYPOTHESIS

Ho1: There is no significant difference in post activity results of accounting students

Ho2: There is no significant difference in the post activity marks of SYB.Com students.

Ho3: There is no significant difference in the post activity marks of TYB.Com students.

Ho4: There is no significant difference in the post activity marks of SYBBA students.

Ho5: There is no significant difference in the post activity marks of TYBBA students.

RESULTS OF HYPOTHESIS

Parameter		Mean	N	Std. Deviation	Std. Error Mean	T	Sig. (2-tailed)
Accounting Students	PreMarks	2.1606	193	1.48608	.10697	-6.971	.000
	PostMarks	3.1451	193	2.17938	.15687		
SYB.Com	PreMarks	2.0714	56	1.38639	.18526	-1.035	.305
	PostMarks	2.2679	56	1.91160	.25545		

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TYB.Com							
	PreMarks	2.1818	88	1.41864	.15123		
						7.235	.000
	PostMarks	3.7955	88	2.07425	.22112		
SYBBA							
	PreMarks	2.3871	31	1.40659	.25263		
						2.060	.048
	PostMarks	3.0968	31	1.68037	.30180		
TYBBA	PreMarks	1.9412	17	2.24918	.54551		
						1.988	.064
	PostMarks	2.8824	17	3.21874	.78066		

Table replicates that the overall students of accounting mean score of pre activity which is lower than the post activity. We can see that mean score of pre activity score was 2.1606 which comes to 3.1451 after activity based teaching. It means due to activity the score of student's improvement. Overall students result of p value is 0.000 which is significant. Likewise, TY B.com student's p value is also significant. Performance of SYB.Com, SYBBA & TYBBA students' pre-marks are lower than the post activity. Which means it shows insignificant value i.e. higher than the 0.05.

OVERALL REASULTS OF PAIRED t TEST

No.	CRITERIA	p VALUE	HO Significant or Not
1.	Overall Students Performance	0.000	Significant
2.	SY B.COM Class	0.305	Insignificant
3.	TY B.COM Class	0.000	Significant
4.	SY BBA Class	0.048	Significant
5.	TY BBA Class	0.064	Insignificant

From the above table we conclude that over all student's performance (P-Value 0.00) and TY B.COM (P-Value 0.00), SY BBA (P-Value 0.00) class are significant in nature S.Y.B. Com class (P-Value 0.305), T.Y.B.B.A. (P-Value 0.064) shows the insignificant value. After conducting pre-test, the result was clear that due to activity base learning there is a significant change in the result of students. From the ANOVA test is can be seen there the students do not find activity base learning helpful but, from T-test, pre-test, post-test, it can be seen that there is a change in results.

CLASS OF RESPONDENTS

Class	Frequency	Percent
SYB.Com	57	29.2
TYB.Com	88	45.1
FYBBA	1	.5
SYBBA	32	16.4
TYBBA	17	8.7
Total	195	100.0

Table shows the present study of students or respondent. Out of total 195 students there were SYB.Com 56(28.7. %), Students of TY B. Com 88 (45.1%), Students of SY BBA 32(16.4%), Students of TY BBA 17 (8.7%).

FINDINGS

The main purpose of the research was to find out whether there is an impact of classroom activities on students learning in B.COM & BBA course at Sardar Patel University. There is a positive impact through activity based learning. 70.26% students agree with the activity based learning is good and advanced teaching method. An analysis of the opinion of respondents regarding we can see that mean score of pre activity score of pre activity score was 2.1606 which comes to 3.1451 after activity based teaching. It means due to activity the score of student's improvement. Mean score of the pre activity score was marks of SY B.com students were 2.0714 which comes to 2.2679 after activity it means due to activity score of students improved. We can have perceived that the mean score of the pre activity marks of SY BBA students were 2.3871 which comes to

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3.0968 after activity it means due to activity the score of students improved. We observed mean value of the pre activity marks of TY BBA students were 1.9412 which comes to 2.8824 after activity.

CONCLUSION

The activity base learning is advanced teaching method which can be used as attractable character for the under graduate level students. It can be used effectively with students, unlike chalk & talk method. Students get relatively more improvement in their skills, like communication, leadership, decision making, presentation skills etc. We concluded that there is significant impact of Activity Based Learning Method on students' performance.

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A STUDY OF TRENDS AND PROBLEMS ON TRANSPORTATION IN CHENNAI CITY

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ABSTRACT
Indian urban areas face a transportation predicament differentiated by intensity of overcrowding, sound, effluence, traffic dead and damages. Tamil Nadu position foremost in urban growth it has been on enlarging since 1961. The indispensable trouble is not the amount of motor vehicle in the nation but their absorption in a small amount of chosen metropolitan cities. In Chennai City, the bus transportation is living being activated by Metropolitan Transport Corporation (MTC), which had a fleet strength of 2,773 buses in 2004. They operate 537 directions and carry 36 lakhs trips/day. Hence, it is suggested that investment in expanded and improved public transport should be given top priority. Restrictions should be made on car use and increased user charges assessed on motorists to reflect the communal and ecological costs of car use.

Keywords: Transport, Vehicles, Accident, Urbanisation and Pollution

I. INTRODUCTION
Developing nations have quite a lot of factors in widespread that add to the harshness of their transportation troubles. Growth of population and urbanisation has paved to the speedy expansion of large cities. The contribution of transportation and other infrastructure services have delayed far at the back demand. Public sector finances are so restricted that financial support for transportation enhancement is unhappily insufficient. Carrying facilities are made use of far away from their intend capability. Furthermore, amenities for pedestrians and cyclists are practically non-existent in the largest part of the cities, thus forcing them to share packed out way with quickly moving motor vehicles.

Indian cities of all sizes are facing the crisis of urban transport. Notwithstanding funds in road transportation and strategy for land utilization and carrying expansion, all countenance the difficulty of overcrowding, passage mishap and air effluence and the problems persist to develop. The big metropolitan are imaging a speedy growth of private vehicles (two wheelers and cars); and in medium and small cities, diverse structure of intermediary civic transport made available by informal sector are under pressure to meet up the mobility demands of metropolitan inhabitants. Several tests have been made by planning authorities and experts to address these problems. In 2006, a National Urban Transport Policy (NUTP) has been adopted by the Ministry of Urban Development and Poverty Alleviation.

The problem of very small amount of per-capita incomes in developing nations is compounded by tremendous earnings disparity. The richest of tenth of the residents characteristically receive over half of sum national income (Vasconcellos, 2001). A large amount of the people is so underprivileged that it cannot have enough money any mechanical transportation at all and must expend even a day for journey. Furthermore, the absorption of assets in the midst of financial and political influential has indistinct convey policies in all developing nations. Whilst the underprivileged undergo a good number from ruthless and deterioration transportation troubles in metropolitan, administration policies normally meeting point on allocation the needs of an elite marginal. Correspondingly, civic transport does not get the financial support or traffic main concern it requirements for the reason that the influential do not employ it. Rapid increase, small earnings, and tremendous disparity are in the middle of the most important fundamental grounds of transportation problems in developing nations. In this background, the objectives of this study are:

1. To study the trends in the development of transport sector in Chennai City
2. To analyse problems of development of transport in Chennai City and
3. To suggest policy measures.

Next section traces the related literature, section three explains the methodology and data sources, traffic composition and motor vehicle expansion in India is analysed in section four, next section examines urbanization and vehicle population in Tamil Nadu, sixth section presents the population, transitory migration of people and vehicle growth in Chennai City, which is followed by problems of carrying in Chennai City in section seven and finally conclusion and suggestions are presented in section eight.

II. LITERATURE REVIEW
Vasconcellos, (2001) scrutinizes the transportation troubles of the underprivileged acquire modest strategy concentration in India for the equivalent motivation most of their requirements are ignored: the need of political

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and financial power, and thus the incapability to influence politicians who outline government policies in addition, in view of the fact that the underprivileged get just about cities largely by on foot or cycling, their particularly non-motorized transportation requirements are yet promote overlooked, because pedestrians and cyclists have no lobby or hold up group to supporter their wellbeing and exert demands on politicians and city planners (Low and Banerjee-Guha, 2003).

The massive prospective civic transportation in India remains to be apprehending, conversely, for the most part by reason of strategy support the mechanical best. Thus, there is no passage main concern of any class (lanes, signals, etc.) for buses, which get completely trapped on overcrowded roadways and normal six to ten km/h in many big cities (Gakenheimer & Zegras, 2003).

Bhupendra Singh & Ankit Gupta (2015) analyzed the ever-increasing travel is a gigantic trouble all over the earth. Intelligent Transportation Systems (ITS) is an incorporated system that equip a wide range of communication, manage, motor vehicle sense and electronic machinery to work out and manage the traffic problems. Vivek Vaidyanathan, Robin A King & Martin de Jong (2017) try to study urban transportation planning in India from a polycentric authority standpoint. Urban transport planning in India is a comparatively new happening and is for the most part top-down. There have been query elevated about the probability of numerous urban transportation projects which have been specially made. A polycentric authority scheme meeting point on numerous actors and power centre with a decentralized and participative pronouncement making process offers a dissimilar way of considerate governance processes and decision making.

METHODOLOGY AND DATA SOURCES OF THE STUDY

The current study is exclusively based on the secondary data collected from different published sources such as Census of India and Ministry of Road and Transport and Highways. The aims of the study have been confirmed using secondary data.

IV. TRAFFIC COMPOSITION AND VEHICLE GROWTH IN INDIA

Traffic masterpiece in India is of an assorted nature. An extensive assortment of concerning a dozen categories of both sluggish and dynamic motor vehicle exists. 2-wheelers and cars report for more than 80 per cent of the means of transportation populace in most big cities. The contribution of buses is insignificant in most Indian cities as measure up to modified vehicle. For example, 2-wheelers and cars collectively compose more than 95 per cent in Kanpur and 90 per cent in both Hyderabad and Nagpur; where in these metropolitan buses comprise 0.1, 0.3, and 0.8 per cent, respectively.

In 2015, 199.3 million vehicles were plying on Indian roads. Table 1 shows total number of recorded motor vehicles in India.

Table-1: Total Number of Registered Motor Vehicles in India: 1951–2015

(In Thousands)

Year	All Vehicles	Two- Wheelers	Cars, Jeeps, and Taxis	Buses	Goods Vehicles	Others
1951	306	27	159	34	82	4
1961	665	88	310	57	168	42
1971	1865	576	682	94	343	170
1981	5391	2618	1160	162	554	897
1991	21374	14200	2954	331	1356	2533
2001	54991	38556	7058	634	2948	5795
2011	141866	41478	7571	669	3045	6100
2015	199365	154298	28611	893	4343	8232

Source: Transport Research Wing, Ministry of Road Transport & Highways, Government of India, New Delhi, Motor Transport Statistics of India, Various issues.

According to information offered by the Ministry of Road Transport & Highways, Government of India, once in a year rate of expansion of motor automobile inhabitants in India has been about ten per cent for the duration of the last decade. The basic difficulty is not the amount of vehicles in the nation but their absorption in a few chosen cities, predominantly in metropolitan cities. It is shocking to note down that 32 per cent of this motor vehicle is carrying out in metropolitan cities alone, which constitute about 11 per cent of the total inhabitants. From the above table, it is inferred that in the year 1951, total vehicles accounts to 306 thousands but during the year 2001, it rose to 54.9 million and in 2011, it records 141.8 million vehicles are practicing in India.

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V. URBANISATION AND VEHICLE POPULATION IN TAMIL NADU

Tamil Nadu stands its position foremost in urban growth in the midst of the fifteen major States in the country. Urban growth has been on the rise since 1961. The 2011 Census shows that 721.38 lakh inhabitants in Tamil Nadu out of which 349.49 (48.44 per cent) live in the 832 urban centres throughout the State. In this above backdrop, town and urban planning assumes great significance. Urban growth is strongly connected with financial expansion which may be conceived as a multi-dimensional process. Additionally to the growth process, failure of monsoon, lack of job prospects for rural unemployed and migration from countryside to metropolitan areas are the causative factors for the process of rapid urbanisation in Tamil Nadu. These particulars are given in Table 2.

Table-2: Trend in Urban Population

(Lakhs)

Year	Persons	Rural	Urban
1961	336.87	246.96 (73.31)	89.91 (26.69)
1971	419.91	287.34 (68.42)	124.65 (29.68)
1981	484.08	324.56 (67.04)	159.52 (32.95)
1991	558.59	367.81 (65.85)	190.78 (39.15)
2001	624.06	349.22 (55.96)	274.84 (44.04)
2011	721.38	371.89 (51.55)	349.49 (48.44)

Source: Director of Census Population., GOI.

Note: Figures in parenthesis shows percentage to total.

According to the 2011 Census, the total amount of metropolitan inhabitant in Tamil Nadu is 349.49 lakhs compared to 90 lakhs in 1961. In a normal course of events emergence of growth poles will hasten the process of urbanisation. But the phenomenal growth of urbanisation in many of the districts of Tamil Nadu in part may be accredited to the changes in nomenclature from countryside to metropolitan in the present Census. All Town Panchayats are being treated as urban irrespective of the fact whether they satisfy the population criterion laid down. The total population has gone up from 336.87 lakhs in 1961 to 721.38 lakhs in 2011, while the share of urban population has moved up from 26.69 per cent to 48.44 per cent during the same period.

VEHICLE POPULATION IN TAMIL NADU

The vehicular population in Tamil Nadu from the year 2005 to 2017 is shown in Table 3.

The once a year expansion rate of vehicle population over the years has recorded around 10 per cent. The vehicle population was 79.66 lakhs in 2005 and it has increased to 2.38 crores in 2017 in complete terms. The growth rate of vehicles during 2005 is 10.55 per cent and in 2017 it is 5.67 per cent. But in the year 2012, it records a high percentage growth rate of 12.50 per cent in Tamil Nadu.

Table-3: Vehicle population in Tamil Nadu

Year	Vehicle population	Growth rate (in percentage)
2005	7966200	10.55
2006	8851672	11.12
2007	9807155	10.79
2008	10789970	10.02
2009	11820613	9.55
2010	12156961	2.85
2011	13660717	12.37
2012	15368625	12.50
2013	17091768	11.21
2014	18807505	10.04
2015	20419018	8.57
2016	22599307	10.68
2017	23881627	5.67

Source: Office of transport commissioner.

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VI. POPULATION, TRANSITORY MIGRATION OF PEOPLE AND VEHICLE GROWTH IN CHENNAI CITY

The velocity of inhabitant's expansion in urban areas far exceeds that of the rural areas. The inhabitants of Chennai Metropolitan Area (CMA), Chennai Urban Agglomeration (CUA) and Chennai City have been increasing over the years; however, the percentage decadal variation of inhabitants has been declining drastically after the year 1971.

The period between 1947 and 2011 witnessed unprecedented growth in both area and population of Chennai City. The urbanised area increased from 130 Sq.km in 1947 to 175 Sq.km in 2011. This growth has been triggered by progressive industrialisation and exodus after Independence. Apart from several big manufacturing in the central public sector, many private automobile and ancillary industries were also established. Two Industrial Estates were also developed under State Government's initiative. The Chennai harbour was widened and deepened to cater to the needs of increasing exports and imports.

Table 4 shows that Chennai City has an inhabitants of 3.97 lakhs in 1871, which increased to 46.81 lakh in 2011.

During 1871-2011 there was more than a nine fold increase in population. The pace of growing population in Chennai City during 1981-1991 was not as rapid as during the three decades of 1951-1981. Nevertheless, over the years, the density of population has steady and stable increase, despite the enlargement of the City three fold. In the year 2002, 45 lakhs of inhabitants are in Chennai City.

The growth of population was more because of enhancing in natural growth rate than a rise in the flow of migrants. In 1971-81 and 1981-91, the decadal growth rate of population was 24.42 and 17.02 per cent respectively. In 1991-2001, it was accounted to 10.32, which is 6.7 percentages less than the previous decade. During the year 2011, it registered to 11.02 per cent with the density of inhabitants of about 26903 per sq.km. The rapid growth of population and the economic activities widened the development of transport in Chennai City.

Table 4. Area, Density, Size and Growth of Population in Chennai City, 1871-2011

Census year	Area in square km	Density of population (per Sq.km)	Index of growth of density	Total population (Nos)	Increase population		Index of growth
					Absolute	Percentage	
1871	71	5600	100	397552	-	-	100
1881	71	5700	102	405848	8296	2.00	102
1891	71	6400	114	452518	46670	10.30	114
1901	71	7800	139	509346	56828	11.20	128
1911	71	8100	145	518660	9314	1.80	130
1921	71	8300	148	526911	8251	1.60	132
1931	75	9800	175	647230	120319	18.60	162
1941	75	11800	211	777481	130251	16.80	195
1951	129	11100	198	1416056	638575	45.10	356
1961	129	13600	243	1729213	313085	18.10	436
1971	129	19100	341	2469213	740072	30.00	622
1981	170	19100	339	3266034	797621	24.42	823
1991	170	22077	394	3822011	555977	17.02	961
2001	172	24231	433	4216268	394257	10.32	1061
2011	175	26903	480	4681087	464819	11.02	1177

Source: Complied from Annual Report, 1951, Health Department of the Corporation of Chennai City and Census of India 1968, 1971 and 2001.

TRANSITORY MIGRATION OF PEOPLE

The multinational nature of Chennai was a reflection of its attractions to migrant groups from all over India. People from neighbouring states and districts make temporary migration to Chennai City for employment, education, trade and other activities. This constitutes a significant proportion of people in Chennai City. The manual or unorganized sector labour from a different parts of the country is arriving to Chennai City for employment. Large number of construction workers makes temporary settlement in Chennai City. They prefer the public transportation system. This adds the already congested public transport into a worse one.

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MANUFACTURING SECTOR

There are large numbers of industries located in Chennai City which are concerned in the production of petrochemicals and substance industry, electrical and vehicle and connected subsidiary industries. Chennai has a huge foundation of skin manufacturing and accounts for half of the total exports of the nation. Tamil Nadu stands for seventy per cent of skin tanning companies in India and nearly 38 per cent of leather foot wear and mechanism; a good number of the footwear industry are within the CMA location. A group of chemical industries are situated in CMA of Manali. Export-processing zone (MEPZ) in Tambaram area, around 261 acres is provided for apparel and other export activities. Tamil Nadu stands for more than one-fifth (21 per cent) of passenger cars, commercial vehicles accounts to 33 per cent and nearly one-third (35 per cent) of automobile goods produced in India. Chennai, the 'Detroit of India' is emerging as a major export hub for cars in South East Asia. Hence, people migrate to this city for various needs and employment.

NEW ECONOMY INDUSTRIES

In India after Karnataka, Tamil Naud is the largest software exporter and 90 per cent of the exports are from Chennai alone. Chennai is a preferred destination for IT sector and it has housed top 10 IT multi national Companies in Indian. The Tidal Park, with a combined area of 2.5 million sq.ft. is an established self-contained IT park housing all the major players in the IT sector.

VEHICLE POPULATION

The nature of expansion of the city, the transportation is one of the reason for wider ramifications for the rapid expansion of the Chennai City, the wider range of business and the quality of the standard of living of the people.

The number of vehicles in Chennai City from the year 1999 to 2016 is given in Table 6.

It is observed that the growth of private vehicles have tremendously increased in Chennai City. It has increased from 9.754 lakh in 1999 to 31.63 lakh in 2016. The total private vehicles had increased in Chennai City by 300 per cent between 1999 and 2016. It is also inferred that there is a rapid increase in the number of MTC buses between 1999 and 2016. The number of MTC buses in Chennai City in the year 1999 and 2016 was 2806 and 3964 respectively.

Table-6: Number of Vehicles in Chennai City

Year	No. of Private Vehicles (in lakh)	No. of MTC buses
1999	9.75	2806
2000	10.68	2845
2001	11.72	2816
2002	12.69	3701
2003	13.78	3673
2004	14.87	3677
2005	16.25	3668
2006	17.80	3677
2007	19.45	3677
2008	24.99	3772
2009	27.05	3162
2010	27.85	3285
2011	29.76	3362
2012	30.02	3408
2014	30.94	3383
2016	31.63	3964

Source: The Hindu, March 2, 2010, Office of transport commissioner.

In Chennai City, the registered vehicle population is depicted in Table 7.

Table-7: Registered Vehicle Population in Chennai City

Year	Registered vehicles
1981	120000
1986	228000
1991	544000

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1996	812000
1998	975000
2012	3760000
2016	4757822
2017	5309906

Source: Office of transport commissioner.

From the above table, it is given that in the year 1981, the number of registered vehicles recorded 1.2 lakhs but it rose to 53.09 lakhs in the year 2017. The figure shows constantly increase in registered vehicle population because on increased population growth, increased urbanisation and rapid economic growth and development in Chennai City.

VII. TRANSPORT PROBLEMS IN CHENNAI CITY

Bus Transport

The bus conveys is being managed by MTC, around 2773 buses had a fleet strength in the year 2004 which carries 36 lakhs trips per day and 537 routes. During the peak hours, the overcrowding recorded more than 150 per cent in some routes as the supply of buses are inadequate.

Accidents in Chennai City

In India most of the cities face the problem of adequate transport facilities and it is deteriorating over the periods. Public transport system have not developed on par with the quality and quantity of demand in traffic. From the year 1998 to 2016, accidents on road in Chennai City is shown in Table 8.

Table-8: Road Accidents in Chennai City 1998 - 2016

Year	Fatal		Grevious Injury		Minor injury		Non-injury	Total accident	No. of persons involved
	N.A	N.P.K	N.A	N.P.I	N.A	N.P.I	N.A		
1998	561	724	1832	1844	1928	3041	882	5203	5609
1999	575	681	87	87	3558	4269	424	4644	5037
2000	574	590	58	61	3956	4768	578	5166	5419
2001	611	638	125	147	3822	4640	684	5242	5425
2002	461	474	212	234	2792	3376	170	3635	4084
2003	509	529	217	238	3274	4069	202	4202	4836
2004	560	575	246	279	3750	4549	317	4873	5403
2005	472	482	423	516	3413	4170	190	4498	5168
2006	1175	1203	255	303	4859	5865	342	6631	7371
2007	1125	1161	178	197	5147	6270	442	6892	7628
2008	859	888	66	72	4296	5060	1602	6823	6020
2009	582	598	121	139	3504	4123	853	5060	4860
2010	604	621	1470	1749	2227	2664	832	5133	5034
2011	906	929	271	320	4513	5343	876	6566	6592
2012	1367	1401	611	712	6581	7916	1104	9663	10029
2013	1215	1247	741	831	6858	7869	891	9710	9947
2014	1020	1046	1139	1341	6551	7914	755	9465	10301
2015	859	886	2949	3406	3196	3914	324	7328	7320
2016	1155	1183	1888	2227	4162	5122	281	7486	8532

Source: DGP, Chennai.

Note: N.A. No. of accident, N.P.K = No. of person killed, N.P.I= No. of person injured

The above table reveals that the number of accidents in 1998 was 5203 and it has increased to 6892 in 2007 and it was 9663 in the year 2012. But during the year 2016, the number of accidents reduced to 7486. This is because of the traffic control, the strict government regulations laid on the transport sector and general precautions and cautionary measures for users of different means of transport.

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CONCLUSION AND SUGGESTIONS

This paper concludes by stating that transport problems are intensifying due to rapid urban growth and rising privatised motorization. Government policies at all levels have not helped to clearly deal with them effectively. Chennai City suffers from problems such as congestion, air pollution, noise and traffic dangers. Hence, it is suggested that investment in expanded and improved public transport should be given top priority. Though separate bus lane is provided for buses (MTC) in some parts of the city, it should be extended to all parts of the Chennai City. Restrictions should be made on car use and increased user charges assessed on motorists to reflect the social, economic and environmental expenses of car use. Modern and advanced facilities for pedestrians and cyclists should be provided to separate them from motor vehicles, thus increasing their safety, while also reducing their interference with traffic flows, especially at intersections. Better traffic regulations, enforcement, and safety training for motorists and non-motorists to ensure safe driving, walking, and cycling.

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MODERN CARPET DESIGNS USING (CAD) IN TUFTED CARPET- MARKET SURVEY

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ABSTRACT
The rudimental aim of this paper to show that how to prepare modern carpet design by using (CAD) in tufted carpet. This paper based on survey of different carpet industries, now this is the age of new innovation and new technology so carpet industries adopt new techniques and developments of carpet design by this customer/buyers attract to procure and market of the carpet industries should boom.This paper outlines and discusses the professional skills and compulsory technological skills needed for design professionals.

Keywords: Handmade emporium, Carpet Expo,Market survey, trends,innovative,prototypes.

OBJECTIVES
The objective of this study was to summarize the history of motifs used in the different region of Bhadohi – Mirzapur - Varanasi Belt. This belt was used for sampling and further production.

INTRODUCTION
In concern to my market survey we visited several places to see different Modern concepts & CAD designs now a day's available in market & readily purchased in national & international market we test marketed with different showrooms in order to understand root marketing beginning with different colour concepts' different materials & different designs' sellers choices as well buyers priority' our test marketing was about introduction of different CAD designs modern classic with new innovations & their effect on buyer's market survey included not only interactions with weavers' showroom but also customers'

It also believes that sustained skill training and talent management backed by on the job training, escort services and financial and technical assistance can create job opportunities in the rural areas.

The design and technical development project is a program sponsored by office of the development commissioner, Handicraft, Ministry of Textiles, Government of India in which 'it has conducted following jobs for 2 months project. The total two months programme including one-month market survey & market testing and one-month Training in Design & Technical Development workshop in "Modern Carpet Designs using CAD in Tufted Carpet" Exclusive for SC Category were organized by IICT, Bhadohi.

SURVEY IN CARPET INDUSTRY
We visited INDIA Pride Handicrafts Emporiums' Huts' in Varanasi here survey was enriched with different technique' developments & changes that carpet industry underwent & how all these changes have been given industry new concepts of CAD designs'.

In addition to these visits' we interacted with different customers national as well as international which were at these showrooms to know what new can be introduced in this industry to achieve new heights & levels via Indian Institute of Carpet Technology Bhadohi (UP).

Survey was at M/s Vikram carpet, M/s Art & Craft at Mirzapur; M/s Shahid Carpets, M/s Ansari Brothers & M/s Carpet Handicrafts at Bhadohi here survey was bestowed with antique design effect on international market how we can blend old & new designs & what will be their effect on market that is national & international' how we can come up with innovative designs that will be accepted by the industry & how we can introduce new concepts in old designs thereby preserving delicacy of history of CAD design.

The Project team have conducted depth of the market in terms of surveyed various states, locations, analyze the market trend, market demand and the appeal for the certain craft allocated. During survey period the team has been visited various Handicraft emporiums, designer stores rural markets, different exporters, manufacturers, buying agent and their catalogue etc. to develop the initials concept for the development of new innovative prototype in the project of excellent quality, good market demand market appealing and various elements which would make the product a success in the market. From preliminary survey, we have gathered some initial concepts to develop minimum ten prototypes by creating innovative and diversified designs on paper for carpet making crafts.

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SURVEY IN DIFFERENT CARPET QUALITY WISE

Woolen Persian (Traditional) Design

- Antique Carpet
- Silk Carpet
- Silk & Woolen Mix carpet (Kashmir Some Traditional & Modern)
- Different types and patterns traditional designs
- Loom Carpet (Broad)
- Viscose Knotted Carpet
- Patch Work Carpet
- Erase Carpet
- Printing Carpet

Dhurry

- 30 Count (Woolen, Cotton, (2, 4, 6 & 8 Sheading))
- 60 Count (Woolen, Geometrical, Floral, Modern & Killim)
- 80 Count (Cotton & Woolen, Stone Wash (Rajasthan))
- 100 Count (Super Fine, Stone Wash (Rajasthan))
- Jute Dhurry
- Hemp (Jute) Dhurry
- Cotton Dhurry
- Synoil Dhurry
- Shaggy Dhurry (Different Artificial Silk & Art Silk)
- Table Tuft Dhurry (Different Artificial Silk & Art Silk)
- Different type Artificial Silk & Woolen Mix Dhurry
- Tie & Dye Dhurry
- Print Dhurry
- Jacquard Dhurry
- Handloom Dhurry
- Sutter Dhurry
- Panja Dhurry
- Sumaq Dhurry
- Loom Dhurry (Broad)
- Leather Dhurry (Flat & Pile)

Tufted

- Woolen Tufted
- Silk Tufted
- Art Silk Tufted
- Embossing Tufted
- Without Embossing Tufted
- Cut & Loop Tufted

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- Pile Tufted
- Floral Tufted
- Modern Tufted
- Traditional Tufted
- Machine made Tufted (Carpet Tiles)
- Table Tuft Carpet
- Tufted Viscose Carpet
- Print Tufted
- Patch work Tufted
- Painting

Nepali

- Traditional Nepali
- Bamboo Silk Nepali
- Art Silk Nepali
- Viscose Silk Nepali
- Woolen Nepali
- Loop Pile Nepali
- Cut Pile Nepali
- Embossing Nepali
- Patch Work Nepali
- Floral, Modern, Geometrical & Plain
- Art Silk and Wool Mix
- Jute mix Nepali
- Print Nepali
- Tie and Dye Print
- Painting

Handloom

- Floor to Floor
- Geometrical
- Floral
- Plain single Colour
- Stripes
- Printing
- Tie and Dye
- Painting

Tapestry Carpets

- Painting
- Land Scape
- Wall Hanging

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Modern Design / CAD up Gradation Training

In the second phase of programme i.e. (23rd November to 23rd December 2017) one-month training. During this period, we have developed some innovative and diversified design related to various society and family traditions of Indians but also from the point of view of pre-market survey and expected a good export order and market ability product, it will necessary to develop a series of product which will suits to the contemporary new solution of the craft skills both in terms of design and product modification and aesthetes for which the program was conducted.

Carpet Fair (Expo) Market Survey and Market Event

The visit to Indian Carpet Expo fair organized by Carpet Export Promotion Council (CEPC) with support from Government of India turns out to be very good platform to learn the carpet market in terms of designs and styles by visiting many small, medium and large handmade carpet exporters from all over India and international buyers from all around world cutting across all continents visited this edition of ICE. Many buyer's representatives and buying offices from India were also present for sourcing. All the innovation showcased here will become benchmark for carpet trends globally. Many innovative products and new designs were displayed by different exporters. The products were very good in terms of quality, designs and new techniques. All exporters showcased their latest range to overseas buyers. This year products and designs were much better than the last year show.

We need to conduct a market survey. During this period of survey, the prototypes created in the project are market tested i.e. they are placed in the market and the survey is conducted in which gives a clear idea of appeal in the market for these products and considering the negative & Positive aspects. At the end of the project the designer along with the organization participated in the marketing events on 16.02.2018 at IICT Exhibition Hall Bhadohi & at India Carpet Expo 2018 New Delhi from 08.03.2018 to 11.03.2018. Hundreds of visitors appreciated the prototypes displayed.

Importance & Methodology of Market Survey

Indian Dhurry has a special place particularly in the developed countries, which absorb 88-90% of Indian carpet exports. USA and Germany, the two largest and established markets for dhurry together account for 76% of India's exports.

Besides, the other developed countries and only a few developing countries account for the rest of the part. Furthermore, the industry is basically both export-oriented and labour intensive. Apart from generating foreign exchange, the industry provides employment to many people. Most of the carpet manufacturing in India takes place in the northern part of the country in the towns of Bhadohi, Mirzapur, Agra, Jaipur, Panipat, Sitapur etc.

Expressing views on the prospects of the Dhurry carpet industry, Aditya Wattal of Chinar International, said: "There is a huge demand for carpet and rugs in European countries. Besides, we also get orders for domestic market but still the comparison is very less as compared to the overseas demand."

New Opportunities through CAD Modern Carpet

Major home furnishing industry is now moving towards dhurry carpet industry. This movement has offered a new market trends for new designs and large market segment. Youth market is now more open to the contemporary and modern carpet industry which has given a new opportunity to the carpet industry. India has far better options than its competitor countries like China in terms of quality and designs. 'India is more flexible and produces all kinds of carpet.

Demand trend for Modern carpets in the future, especially in terms of products and designs of CAD

Abstract designs are a major trend. People have been buying oriental designs for quite some time and certainly seek a change now. In terms of materials wool and viscose blends and pure viscose will be preferred over pure wool. This is because the younger generation prefers the fashion elements like shine, resilience and strength of viscose. They do not want very long lasting, but bright, trendy and cheaper floor covering, which they can change frequently.

Popularity of polyester based, hand tufted shaggy carpets is being replaced in the last 2-3 years by wool-viscose items, which are popular in both hand-made and hand loom categories. In terms of pile and thickness, trend remains the same as before, but colors, designs and materials are in for a change.

Coming trends of Modern Carpets through CAD

New designs and products are developed by the Indian carpet industry with high frequency. High-knot Indo Nepal and hand tufted carpets in abstract designs, lighter colours, viscose and viscose blended range, poofs, flat woven carpets, Killim, cotton and woolen durries, woolen carpets with bamboo and silk, patchwork, recycled, worn out look, shaggy and silk carpets were in demand at ICE.

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Traditional oriental designs and conventional carpets were not much in demand. Contemporary, young designs and styles were preferred. Buyers specifically asked for "shining products with lower prices". Unique feature of these carpets is that they are eco-friendly, water resistant, can be cleaned simply by wiping with a cloth. ICE displayed bold colors and unconventional designs. "The time when floors played subordinate role to other interior furnishings is over. Today, the diversity of materials, colors and designs is unlimited; making floors interior designs is unlimited, making floors an interior design object. This trend was clearly visible throughout Indian Carpet Expo", Buyers from US, U.K., Brazil South Africa, & other European Countries were impressed with the innovations.

The report seeks to put forward the persistent efforts of individuals involved in the concerned cluster.

1. Review the current Cluster, people, place, product and the systems practiced in the future direction for the cluster development.
2. Analysis of challenges in various cluster to study the wide range of diversified products during survey. The following methods were adopted to analyze various aspects and diverse possibilities. Interviews were conducted in retailers, export house, Artisans, Master Craft Person and End Users shared their views.

MODERN DESIGN & CAD (Computer Aided Design) Skilled

These are the experienced craft men who are highly skilful and familiar with techniques and intricacy of craft. They can be instrumental in new product and new design development, but they generally hold that the existing designs and colour combinations are time tested and, marketable and there is no need to change. Thus, they are resistant to change and don't allow their selection for such programs. However, to make the product / prototypes more effective forty such artisans are selected for the program.

DESIGN SEMI-SKILLED

These are the relatively younger and less experienced craftsmen. They are also well versed with techniques of craft and demonstrate a willingness to change. Thus, such artisans are ideal for design development program owing to their interest in such program.

MARKET SURVEY & TEST REPORT

Conceptualization

A detailed survey of the area made to access the existing design in the dhurry Carpet Technique, the available materials, technical inputs, production process and marketability of production process and marketability of product etc. for the development of new designs with new technique which can easily marketed. From the survey it was established that most of the women-men produced their handicraft items for their personal use and for the sale in local market on local demand, with a very little style and designs. In this modern age life style has been changed completely and there is a need to change the product style / Technique also. During this period individual selects product according to the choice of, pattern and design etc., not according to the society and family traditions. From this point of view and to get a good export order and marketability product, it was necessary a series of product which will suits to the contemporary new solution of the craft skills both the in terms of design and product modification and aesthetes for which the program was conducted.

MARKETING SCENARIO

Key segment features

- Design craze,
- Quality aspect,
- Price consideration,
- Customer requirement

Buyer Behavior

- Value for the products and appreciate the uniqueness of the product,
- Most valuable features are ethnic look.

Buyer characteristic

- Look for product which has an aesthetic beauty with Indian touch

Foreign customers

- Focus on designing,
- Highly trendy,

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- Focus on neatness of workmanship,
- Finishing is also one of the key features which buyers looks for,
- Price is important factor which buyers especially Indian costumers keep in mind.

EXPECTATION OF MARKET THROUGH PROPOSED MARKETING MIX

Product

- Through research designs,
- Product diversification needs to be done keeping with market demand,
- Timely development of new designs

Price

- The cost frame needs to be flexible and technologically sound

Promotion

- Exhibitions are required to expand the marketing of these products in domestic and international market

MARKET SURVEY & REPORT

The project on the dhurry Carpet is very interesting because this project related to art and craft related to Uttar Pradesh, Haryana and Rajasthan manufactured with new technique and these projects shows the image of history and culture of- the country. We intervened several respondents during market survey conducted in different carpet belts of India of prime location to get attention of possible buyers in domestic and overseas. A lot of Positive comments and appreciation have been received about prototypes developed during the project.

CARPET INDUSTRY (MARKET) FEEDBACKS

To gauge the success of integrated design and technical development project in terms of design value and prototype, a market feedback programme was undertaken during the project. The marketing process was undertaken on various levels at local market and participation in marketing events. This market feedback programme was undertaken with participation of Empanelled Designer, Master Craftsperson along with all the staffs and faculty with Director, IICT, at different stages of the programm.

EXPERTS VIEW

This Design and Technical Development workshop in Indian Design in Dhurry Craft is the attempt in the development of poor crafts person in these craft. It has been found that the design provided by the exporters and traders are very old and not suitable for the emerging Market trends. No new lines of designs have been developed by any government or non-government agency to exploit the potential of the urban and export market. The organization realizes the need to do such program that could provide to the craft person inputs like designing and new technique of production.

These craft persons are in the state of flux, because of uncertain economic opportunity and not very promising prospect of their trade. The handicraft industry had been enjoyed better days in recent times because of government and non-governmental support by IICT. During the last few years the export trade had prospered and the products of crafts especially for floor covering have played a great role in this context. However, lack of new designs and techniques were badly affected export which can now eliminate such type of program.

The problems of these crafts are the design. The designs are stereotype and are repeatedly practiced for long thus not fetch a good price. Today is the world of designer products and the consumers are ready to pay a little too extra if the product is a designer one. The problems confronting production and design development need to be the reverse and remedial measures taken up so as to suit potential demand both at home and abroad.

The market survey was based on the questionnaire prepared and the response received from the carpet manufacturers / exporters / buyers / buying agents etc. The details of questionnaire and the response are summarized hereunder in the form of questions asked

OUR DOMESTIC MARKET

It is time carpet industry tries to develop the domestic market as well. Keeping in view substantial growth of middle class population in India and knowing well about their aspiration for better lifestyles and well decorated houses, there are lots of marketing opportunities within India for carpets and handicrafts which manufacturers need to explore.

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IDEAS AND CONCLUSIONS

Carpet industry is an expensive industry as it is totally handmade with purest quality of products, my survey concluded that we must maintain the quality but thereby decrease the cost in order to save the industry from Chinese carpets which now a days are increasing market penetration.

The survey is enriched with different concepts & test marketing reflected the market penetration of IICT Bhadohi due to which modern machinery & upgraded looms have seen their place in Bhadohi which was a distant dream.

We have made the market survey at various places that are running the business of carpet making and with the customers, other than manufactures. we have prepared some new CAD designs which the part of this survey and we are hope these will be gone through and appreciated after examination. However final report containing full details will be submitted in due course of time.

My sincere thanks to IICT Bhadohi due to which we got the opportunity of interaction with different caste & creed & provide my suggestions.

1) Artisans should be given practical trainings on improved tools and equipment an about the latest technologies.
2) They must be educated related to their field and be given idea about the vast craft business flourishing in the other parts of the countries.
3) Skill enhancement training program should be organized.
4) Organization should take step to give exposure to artisans to the national and international market.
5) The organization should make the need for the products into the market by participating in the fairs and organizing special promotional selling counters in the metro cities.
6) The organization should come forward to invest capital for the benefits of the artisans by giving those at once or working with them on partnership basis.

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VIBRATION ANALYSIS OF BEAMS OF DIFFERENT MATERIALS AND CONFIGURATIONS

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ABSTRACT
Analysing damping in structures made of different materials (Aluminium, M.Steel, S. Steel, Wood etc.) and different cross- sections still remains as one of the biggest achievements. All materials posses certain amount of internal damping, which manifested as dissipation of energy from the system. This energy in a vibratory system is either dissipated into heat or radiated away from the system. Material damping or internal damping contributes to about 10-15% of total system damping. The main objective of this paper is to calculate and compare and analyse the experimental and theoretical values of damping ratios and natural frequencies of Aluminium, M.Steel, S. Steel, Wood by free vibration. Cantilever beams of required size & shape are prepared for experimental purpose & damping ratio is investigated. Damping ratio is determined by half-power bandwidth method. This paper presents results of an experimental free vibration analysis of beams made with different materials such as Aluminium, M.Steel, S. Steel, Wood of different x-sections. The beams were excited using wooden mallet and signals were catched with the help of accelerometer attached with VIB SCANNER instruments. Then FRF (Frequency response functions) were obtained using omnitrend software to identify fundamental natural frequencies and damping ratios.

Keywords: DCVA, PC for fetching FFT Spectrum, Beams of different x-sections and materials, Clamp, Accelerometers, Omni trend Software, Accelerometer wires, Mallet for exciting the beams.

1. INTRODUCTION
The most basic mechanical system is the single degree of freedom system, which is characterized by the fact that its motion is described by a single variable or coordinates. But beams are the examples of infinite degrees of freedom systems. Such models are often used as an approximation for a generally more complex system. Excitations can be broadly divided into two types, initial excitations and externally applied forces. The behavior of a system characterized by the motion caused by these excitations is called as the system response. The motion is generally described by velocities. The vibration problems of uniform and non-uniform Euler-Bernoulli beams have been solved analytically or approximately for various end conditions. In order to calculate fundamental natural frequencies and related mode shapes, well known variational techniques such as Rayleigh-Ritz and Galerkin methods have been applied in the past. Besides these techniques, some discretized numerical methods were also applied to beam vibration analysis successfully. To understand the effect of free vibration on the cantilever beam, we need to understand and calculate the following parameters:

- Stiffness of the cantilever beam.
- Mass of the cantilever beam

A system is said to be a cantilever beam system if one end of the system is rigidly fixed to a support and the other end is free to move. Vibration analysis of a cantilever beam system is important as it can explain and help us analyze a number of real life systems. This paper addresses the calculation of natural frequencies and damping ratios for non-rotating cantilever beams.

The damping characteristics of certain steels, cast iron and other metals were studied by Adams [1]. Further Lee and McConnell [2] did some work on experimental cross verification of damping in three metals. Then after some period of time Kume and Hashimoto [3] studied material damping of cantilever beams. Afterwards, Yoo and Shin [4] studied vibration analysis of rotating cantilever beams. Lassoued and Guenfoud [5] did some work on accurate calculation of free frequencies of beams & rectangular plates. Kaya [6], studied the analysis of free vibrations of rotating Timoshenko beam by differential transform method. Shavezipur and Hashemi [7] did a lot of work on free vibrations of triply couple centrifugally stiffened non-uniform beams using a refined dynamic finite element method. Prasad and seshu [8], studied the dynamic characteristics of structural materials using modal analysis. Influence of horizontal excitations on dynamic stability of a slender beam under vertical excitation was studied by Chiba [9]. Then in this field Rezaee and Hassannejad [10], analyzed the damped free vibrations of a beam with a fatigue crack using energy balance methods. Ferezqi et al. [11], presented the analytical approach to free vibration of cracked Timoshenko beams made of functionally graded materials. Supercritical vibration of non-linear coupled moving beams based on discrete four year transform was studied by Ding et al. [12]. Further Shahidi et al. [13], worked on solution of free nonlinear vibrations of beams. Then free vibrations of beams with general boundary conditions were studied by Li [14]. Afterwards, Naik and Malik

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[15] experimented modal testing for estimating the dynamic properties of a cantilever beam. Then, a study on a note on the vibrations of generally restrained, end-loaded beams was done by Register [16]. Then after some time Ho and Chen [17] did some work in this field on free transverse vibrations of an axially loaded non-uniform spinning twisted Timoshenko beam using Differential Transform. Continuously, Hsu et al. [18], worked on free vibrations of non-uniform Euler-Bernoulli beams with general elastically end constraints using Adomian modifiad decomposition method. Then, Wang and Lin [19], analyzed dynamically the generally supported beams using Fourier series. A study similar to this was done by Kim and Kim [20] on vibrations of beams with generally restrained boundary conditions using Fourier series.

2. DESCRIPTION OF DIFFERENT BEAMS

In this paper four types of beams having different materials and x-sections have been taken into consideration. The combination of beams is as follows:

Table-1: Description of different beams

SPECIMEN	DIMENSIONS (mm^3)	NOTATION
ALUMINIUM	800 × 32 × 6.5	AL-1
	800 × 32 × 3.5	AL-2
	1200 × 32 × 6.5	AL-3
	1200 × 32 × 3.5	AL-4
MILD STEEL	800 × 32 × 6.5	MS-1
	800 × 32 × 3.5	MS-2
	1200 × 32 × 6.5	MS-3
	1200 × 32 × 3.5	MS-4
S. STEEL	800 × 32 × 6.5	SS-1
	800 × 32 × 3.5	SS-2
	1200 × 32 × 6.5	SS-3
	1200 × 32 × 3.5	SS-4
WOOD	800 × 32 × 6.5	W-1
	800 × 32 × 3.5	W-2
	1200 × 32 × 6.5	W-3
	1200 × 32 × 3.5	W-4

Fig.1. (a) below shows of a cantilever beam with rectangular cross section, in our case there are different configurations of the beams which can be subjected to bending vibration by giving a small initial displacement at the free end; and Fig.1. (b) depicts of cantilever beam under the free vibration. In this research work, experimental frequencies of the beams have been found out through FRF or FFT diagrams and then they are compared with theoretical frequencies found by calculations. Damping ratios have been calculated by Half Power Bandwidth method.

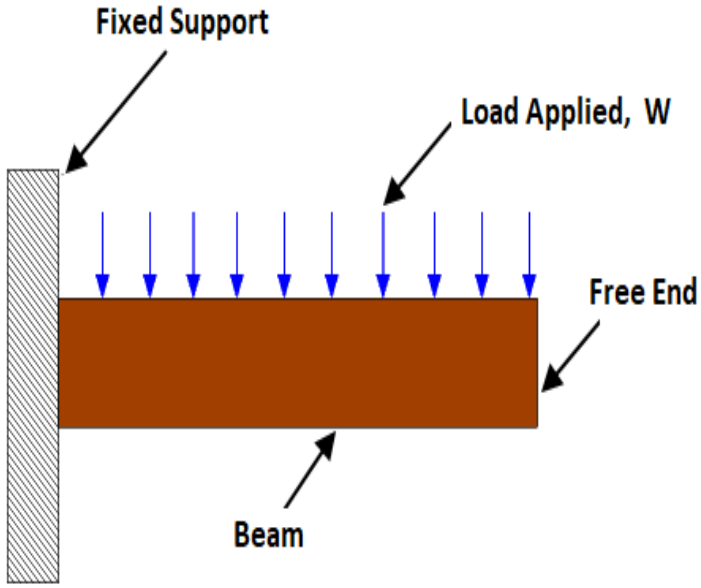

Figure-1: A cantilever beam (Undeflected)

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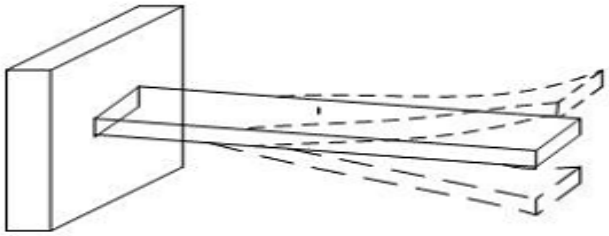

Figure-2: The beam under free vibrations (Deflected)

THEORETICAL CALCULATIONS FOR NATURAL FREQUENCY

For calculating natural frequency, first of all calculate stiffness i.e. K which is given by:-

$$k = \frac{3EI}{L^3} \quad \text{N/m}$$

Where E is the modulus of elasticity of the material, I the mass M.O.I and L be the length of the beam.

After finding stiffness, mass of the beam is calculated.

Because mass of the beam can be get by multiplying volume (Vol.) of the beam with mass density (ρ) of the beam as under:

m = volume of the beam × mass density of the beam (ρ)

$$\omega_n = \frac{1}{2\pi}\sqrt{\frac{k}{m}} \text{ Hz}$$

Here ω_n= Theoretical Natural Frequency. Which can also be written as $(\omega_n)_{Th}$

SPECIFAICATIONS OF DIFFERENT BEAMS

Table-2.1

STAINLESS STEEL	
Flexural Member	Beam
Length	800 & 1200 mm
Breadth	32 mm
Thickness	3.5 & 6.5 mm
Boundry Condition	Cantilever
Mass Density (ρ)	8000 kg/m^3
Modulus of Elasticity (E)	200 GPa

Table-2.2

ALUMINIUM	
Flexural Member	Beam
Length	800 & 1200 mm
Breadth	32 mm
Thickness	3.5 & 6.5 mm
Boundry Condition	Cantilever
Mass Density (ρ)	2700 kg/m^3
Modulus of Elasticity (E)	69-70 GPa

Table-2.3

MILD STEEL	
Flexural Member	Beam
Length	800 & 1200 mm
Breadth	32 mm
Thickness	3.5 & 6.5 mm
Boundry Condition	Cantilever
Mass Density (ρ)	7850 kg/m^3
Modulus of Elasticity (E)	200 GPa

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Table-2.4

WOOD	
Flexural Member	Beam
Length	800 & 1200 mm
Breadth	32 mm
Thickness	3.5 & 6.5 mm
Boundry Condition	Cantilever
Mass Density (ρ)	680 kg/m^3
Modulus of Elasticity (E)	11 GPa

Tables 2.1 to 2.4 show the specifications of beams of different materials i.e. Aluminium, Mil Steel, S. Steel and Wood.

THEORETICAL CALCULATIONS FOR DAMPING RATIO

To estimate damping ratio from frequency domain, we may use half-power bandwidth method. In this method, FRF amplitude of the system is obtained first. Corresponding to each natural frequency, there is a peak in FRF amplitude. 3 dB down from the peak there are two points corresponding to half power point, as shown in the figure below. The more the damping, the more the frequencies range between these two points. Half-power bandwidth (BD) is defined as the ratio of the frequency range between the two half power points to the natural frequency at this mode.

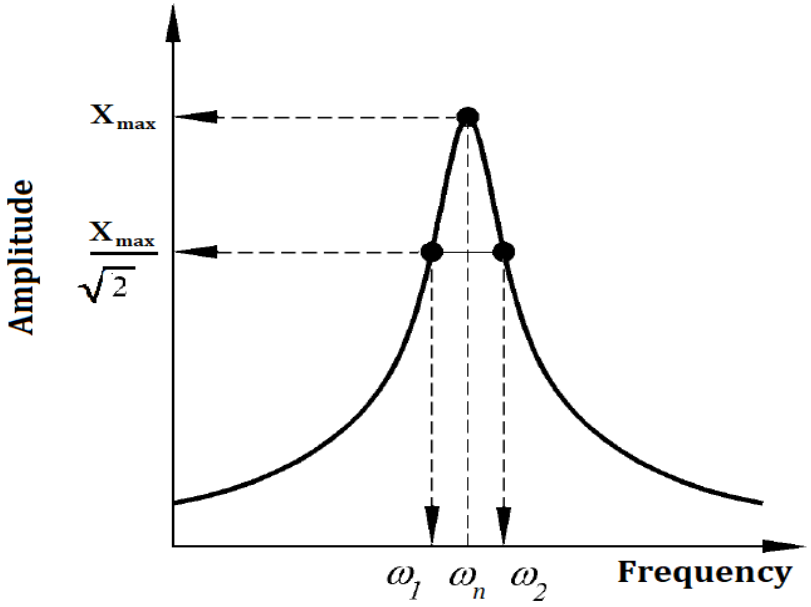

Figure-3: Damping ratio by Half Power Bandwidth Method

$$\frac{\omega_2 - \omega_1}{\omega_n} = 2\zeta$$

Or $$\zeta = \frac{\omega_2 - \omega_1}{2\,\omega_n}$$

Loss Factor, $\eta = 2 \times \zeta$

Here ω_n= experimental natural frequency, which is found from FFT diagram and can also be written as $(\omega_n)_{Exp.}$

3. DESCRIPTION OF THE EXPERIMENTAL SETUP

Free vibration is conducted on the test specimens to obtain its dynamic characteristics including natural frequencies and damping ratios. The beam is clamped on the table with the help of clamping device arrangement. The impact is applied by striking the free end of the test specimen (horizontally mounted, slender, uniform cross section, Aluminium, Mild Steel, Stainless Steel and Wood cantilever beam) on the table with one end fixed has dimensions (800 mm × 32 mm × 6.5 mm), (800 mm × 32 mm × 3.5 mm), (1200 mm × 32 mm × 6.5 mm), (1200 mm × 32 mm × 3.5 mm) as shown in Figure 4 by using a mallet.

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Figure-4: Experimental Setup

During free vibrations, the dynamic responses of the beam are measured through the accelerometer as shown in Figure 5. For this test, the location of accelerometer at free end is carried out in order to extract the signals of vibration. The layout of the sensors on the test specimen is depicted in Fig. 3.3. The vertically mounted accelerometer at free end is used primarily for measuring the response in terms of acceleration. A data acquisition system i.e. vibscanner is used to store the record data and transfer measured data to the pc for post processing as shown in Fig. 4. Frequency response functions (FRFs) were obtained using vibscanner software and were processed using OMNITREND Solutions analysis to identify natural frequencies, damping and the corresponding mode shapes of the beams.

Figure-5: Vibscanner

Figure-6: Accelerometer

The instruments used in the experiments include accelerometers and a vibration analyzer (DCVA). The accelerometer directly measures the velocity of bearing housing vibrations and displays in the vibration analyzer.

4. EXPERIMENTAL PROCEDURE

Following is the procedure of experimentation

- A beam of a particular material (aluminum, mild steel, stainless steel and wood), dimensions (L, w, d) was used as a cantilever beam.
- The fixed end was made by fixing the beam with the help of clamp (bolt is attached) fixed on the table.
- The connections of the vibscanner, accelerometers were properly made.

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- Accelerometer was placed at the free end of the cantilever beam, to measure the vibration response.
- The free end of a cantilever beam was struck with a wooden mallet and beam starts vibrating.
- All the data was recorded, obtained from the vibrating beam with the help of vibscanner as the accelerometer is attached to it.
- The experiments were repeated to check the repeatability of the experimentation (i.e. vibration data).
- Repeat the whole experiment for different material by changing the parameters i.e. length & thickness.
- The whole set of data was recorded and then the data was imported into the PC, further processing and analysis was done using OMNITREND software.

5. RESULTS AND DISCUSSIONS

5.1 Vibration Characterstics of Beams of Size 800 × 32 × 6.5 of Differtent Materials

The Vibration characteristics (natural frequency & damping ratio) of brass beam of size 800 × 32 × 6.5 mm for Aluminium, Mild Steel, Stainless Steel and Wood have been determined by spectrum graphs between amplitude in terms of displacement and excitation frequency. Damping ratio is calculated with the help of half power bandwidth method.

The FRFs obtained using omnitrend software for the said beam using vibscanner has been shown in the figures 7.1 to 7.4.

ALUMINIUM -1

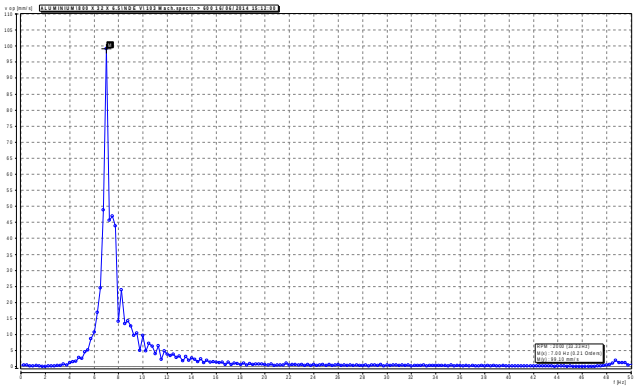

Figure-7.1: FRF graph for AL-1

MILD STEEL- 1

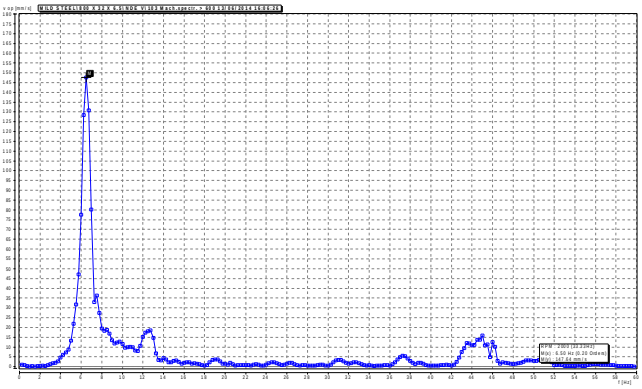

Figure-7.2: FRF graph for MS-1

S. STEEL- 1

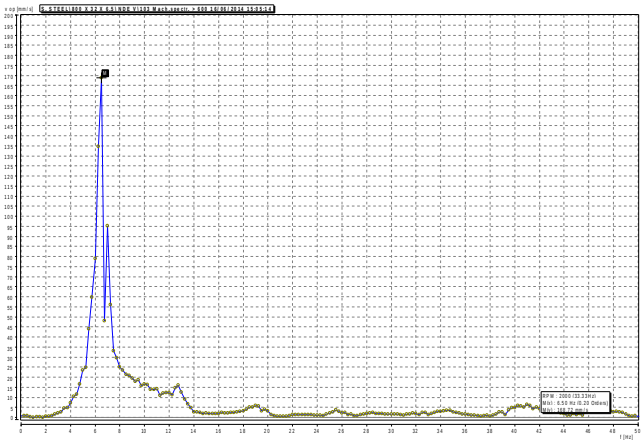

Figure-7.3: FRF graph for SS-1

WOOD – 1

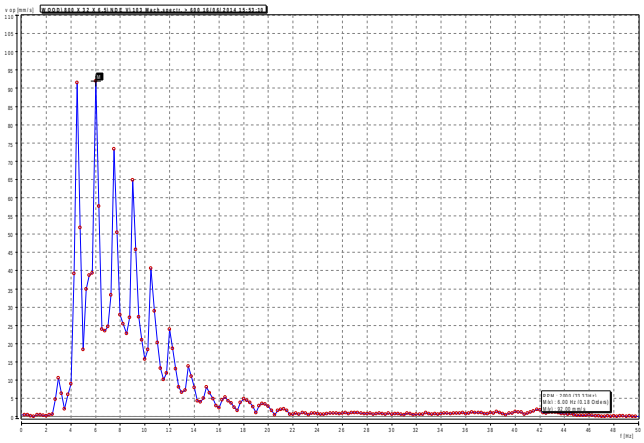

Figure-7.4: FRF graph for W-1

From Figure 7.1, beam of aluminum of the size 800 × 32 × 6.5, the natural frequency corresponds to the peak response can be seen to be 7 Hz. The half power points where the response amplitude is equal to .707 times the peak response can be identified as ω_1 = 6.5 Hz and ω_2 = 7.5 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of aluminium corresponding to natural frequency 7 Hz is 0.0714. The corresponding theoretical frequency for this beam comes out to be 4.11 Hz as compared to the experimental frequency of 7Hz.

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From Figure 7.2, beam of mild steel of the same size, the natural frequency corresponds to the peak response can be seen to be 6.5 Hz. The half power points can be identified as $\omega_1 = 6.1$ Hz and $\omega_2 = 7.1$ Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 6.5 Hz is 0.077. The corresponding theoretical frequency for this beam comes out to be 4.09 Hz as compared to the experimental frequency of 6.5 Hz.

From Figure 7.3, beam of stainless steel of the same size, the natural frequency corresponds to the peak response can be seen to be 6.5 Hz. The half power points can be identified as $\omega_1 = 6.2$ Hz and $\omega_2 = 6.8$ Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 6.5 Hz is 0.046. The corresponding theoretical frequency for this beam comes out to be 4.04 Hz as compared to the experimental frequency of 6.5 Hz.

From Figure 7.4, beam of wood of the same size the natural frequency corresponds to the peak response can be seen to be 6.0 Hz. The half power points can be identified as $\omega_1 = 6.1$ Hz and $\omega_2 = 6.3$ Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 6.0 Hz is 0.016. The corresponding theoretical frequency for this beam comes out to be 3.4 Hz as compared to the experimental frequency of 6 Hz.

5.2 Vibration Characterstics of Beams of Size 800 × 32 × 3.5 of Differtent Materials

The Vibration characteristics (natural frequency & damping ratio) of brass beam of size 800 × 32 × 3.5 mm for Aluminium, Mild Steel, Stainless Steel and Wood have been determined by spectrum graphs between amplitude in terms of displacement and excitation frequency. Damping ratio is calculated with the help of half power bandwidth method.

The FRFs obtained using omnitrend software for the said beam using vibscanner has been shown in the figures 8.1 to 8.4.

ALUMINIUM – 2

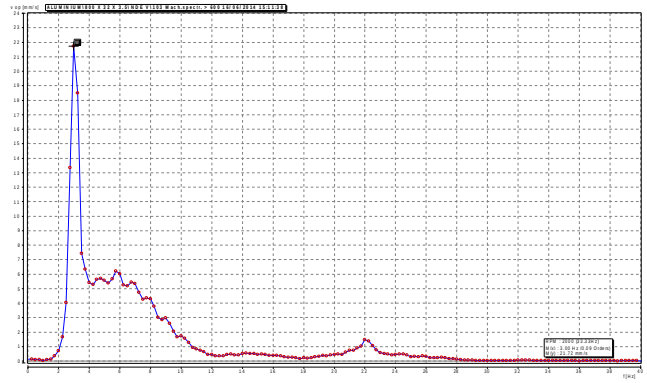

Figure-8.1: FRF graph for AL-2

MILD STEEL – 2

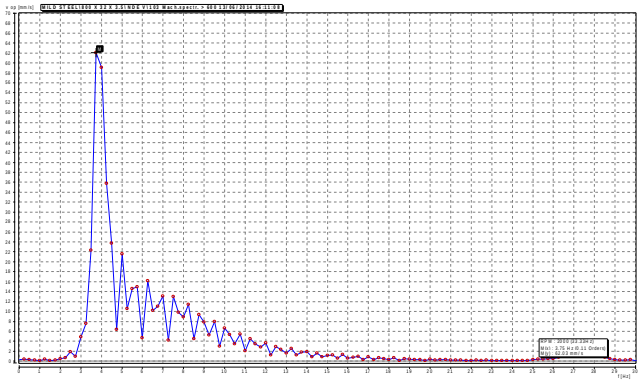

Figure-8.2: FRF graph for MS-2

S STEEL – 2

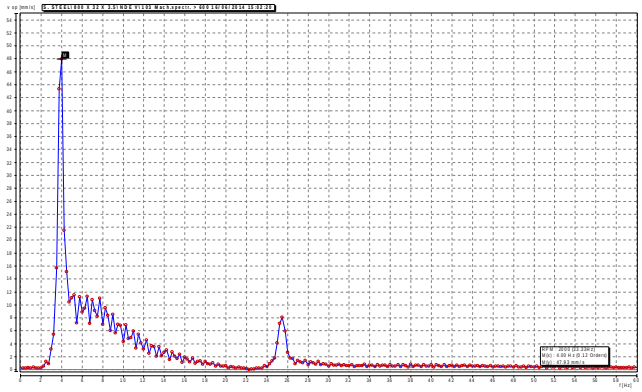

Figure-8.3: FRF graph for SS-2

WOOD - 2

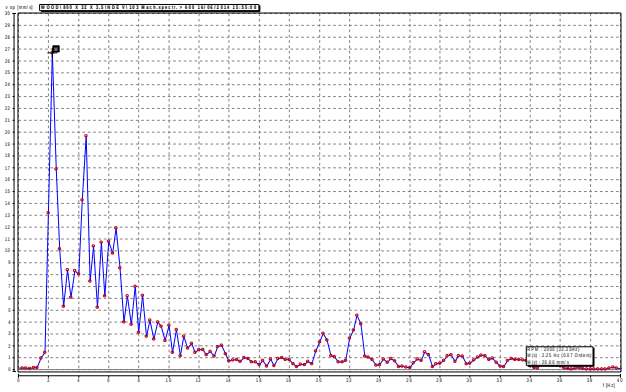

Figure-8.4: FRF graph for W-2

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From Figure 8.1 beam of aluminium of the size 800 × 32 × 3.5, the natural frequency corresponds to the peak response can be seen to be 3 Hz. The half power points where the response amplitude is equal to .707 times the peak response can be identified as ω_1 = 2.9 Hz and ω_2 = 3.7 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of aluminum corresponding to natural frequency 3 Hz is 0.133. The corresponding theoretical frequency for this beam comes out to be 2.21 Hz as compared to the experimental frequency of 3 Hz.

From Figure 8.2 beam of mild steel of the same size, the natural frequency corresponds to the peak response can be seen to be 3.75 Hz. The half power points can be identified as ω_1 = 3.7 Hz and ω_2 = 4.2 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 3.75 Hz is 0.067. The corresponding theoretical frequency for this beam comes out to be 2.19 Hz as compared to the experimental frequency of 3.75 Hz.

From Figure 8.3 beam of stainless steel of the same size, the natural frequency corresponds to the peak response can be seen to be 4 Hz. The half power points can be identified as ω_1 = 3.8 Hz and ω_2 = 4.10 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 4 Hz is 0.0375. The corresponding theoretical frequency for this beam comes out to be 2.17 Hz as compared to the experimental frequency of 4 Hz.

From Figure 8.4 beam of wood of the same size the natural frequency corresponds to the peak response can be seen to be 2.25 Hz. The half power points can be identified as ω_1 = 2.1 Hz and ω_2 = 2.3 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 2.25 Hz is 0.044. The corresponding theoretical frequency for this beam comes out to be 1.75 Hz as compared to the experimental frequency of 2.25 Hz.

5.3 Vibration Characterstics of Beams of Size 1200 × 32 × 6.5 of Differtent Materials

The Vibration characteristics (natural frequency & damping ratio) of brass beam of size 1200 × 32 × 6.5 for Aluminium, Mild Steel, Stainless Steel and Wood have been determined by spectrum graphs between amplitude in terms of displacement and excitation frequency. Damping ratio is calculated with the help of half power bandwidth method.

The FRFs obtained using omnitrend software for the said beam using vibscanner has been shown in the figures 9.1 to 9.4.

ALUMINIUM - 3

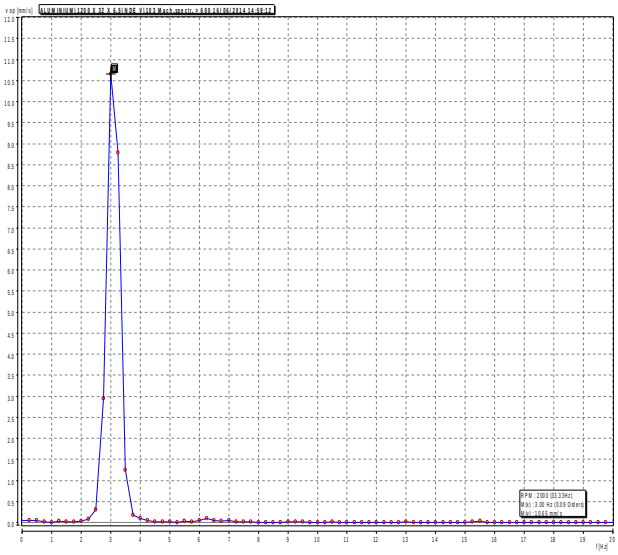

Figure-9.1: FRF graph for beam AL-3

MILD STEEL - 3

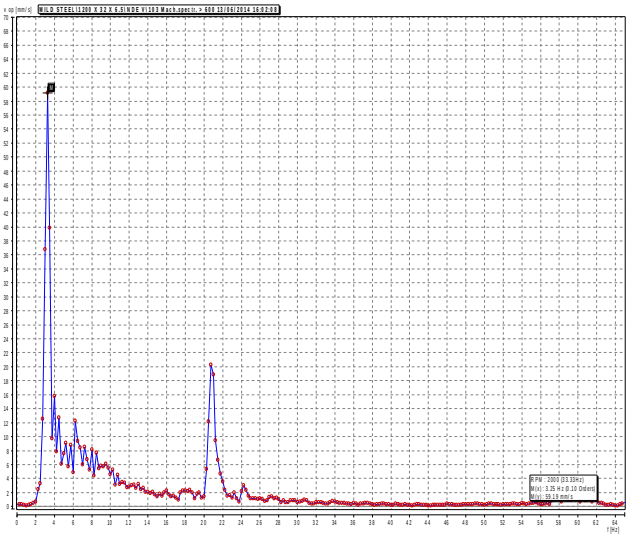

Figure-9.2: FRF graph for beam MS-3

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S. STEEL - 3

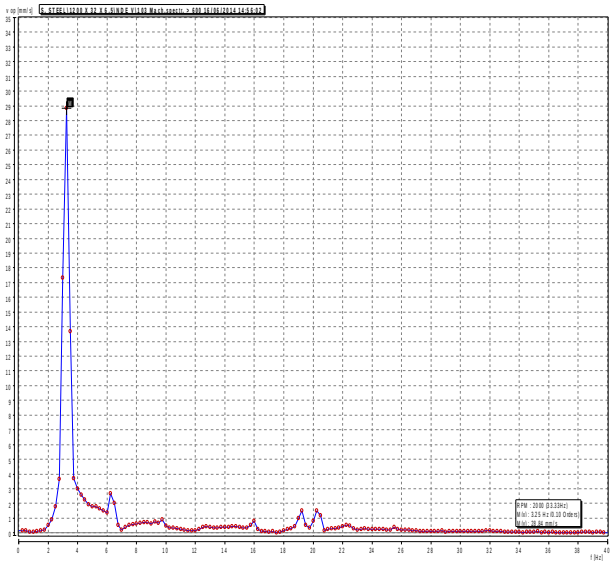

Figure-9.3: FRF graph for beam SS-3

WOOD - 3

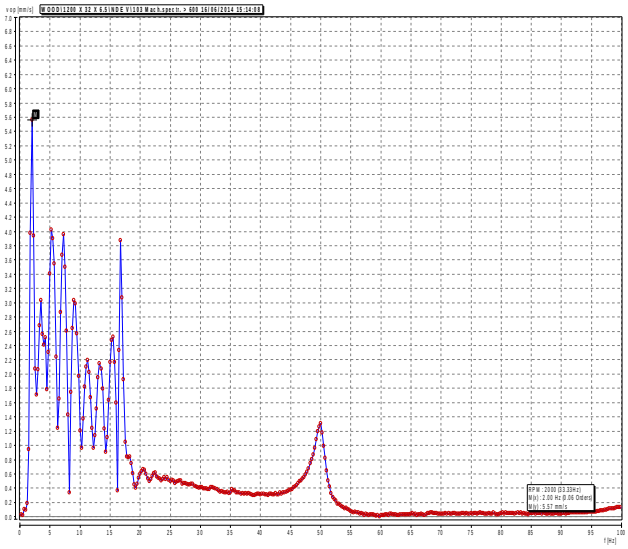

Figure-9.4: FRF graph for beam W-3

From Figure 9.1 beam of aluminium of the size 1200 × 32 × 6.5, the natural frequency corresponds to the peak response can be seen to be 3.00 Hz. The half power points where the response amplitude is equal to .707 times the peak response can be identified as ω_1 = 2.8 Hz and ω_2 = 3.4 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function. Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of aluminium corresponding to natural frequency 3 Hz is 0.1. The corresponding theoretical frequency for this beam comes out to be 1.83 Hz as compared to the experimental frequency of 3 Hz.

From Figure 9.2 beam of mild steel of the same size, the natural frequency corresponds to the peak response can be seen to be 3.25 Hz. The half power points can be identified as ω_1 = 3.0 Hz and ω_2 = 3.75 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 3.25 Hz is 0.115. The corresponding theoretical frequency for this beam comes out to be 1.81 Hz as compared to the experimental frequency of 3.25 Hz.

From Figure 9.3 beam of stainless steel of the same size, the natural frequency corresponds to the peak response can be seen to be 3.25 Hz. The half power points can be identified as ω_1 = 3.0 Hz and ω_2 = 3.4 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 3.25 Hz is 0.0615. The corresponding theoretical frequency for this beam comes out to be 1.8 Hz as compared to the experimental frequency of 3.25 Hz.

From Figure 9.4 beam of wood of the same size the natural frequency corresponds to the peak response can be seen to be 2.00 Hz. The half power points can be identified as ω_1 = 1.8 Hz and ω_2 = 2.45 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 2.00 Hz is 0.162. The corresponding theoretical frequency for this beam comes out to be 1.45 Hz as compared to the experimental frequency of 2.00 Hz.

5.4 Vibration Characterstics of Beams of Size 1200 × 32 × 3.5 of Differtent Materials

The Vibration characteristics (natural frequency & damping ratio) of brass beam of size 1200 × 32 × 3.5 for Aluminium, Mild Steel, Stainless Steel and Wood have been determined by spectrum graphs between amplitude in terms of displacement and excitation frequency. Damping ratio is calculated with the help of half power bandwidth method.

The FRFs obtained using omnitrend software for the said beam using vibscanner has been shown in the figures 10.1 to 10.4.

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ALUMINIUM – 4

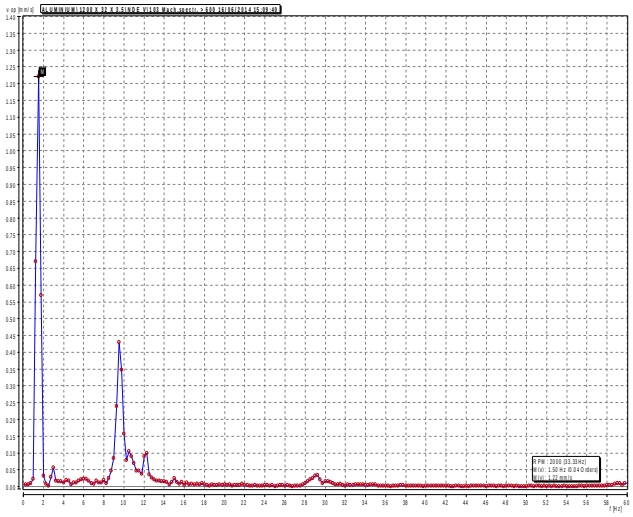

Figure-10.1: FRF graph for beam AL-4

MILD STEEL – 4

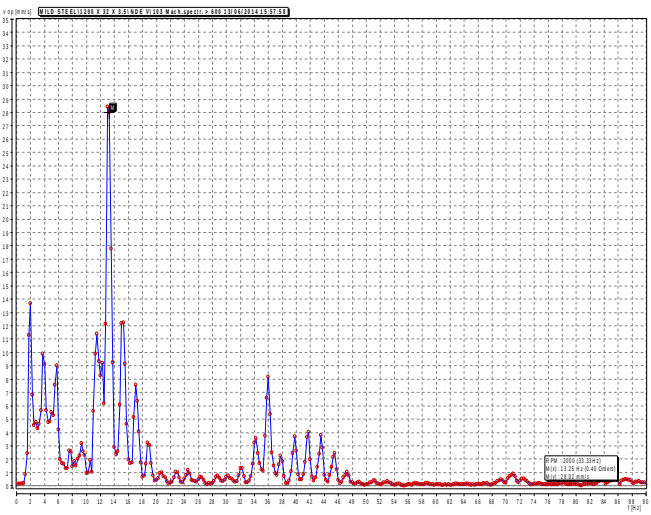

Figure-10.2: FRF graph for beam MS-4

S. STEEL – 4

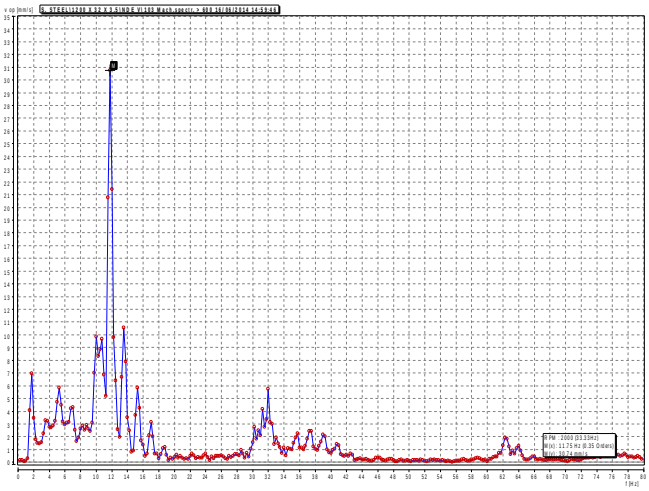

Figure-10.3: FRF graph for beam SS-4

WOOD – 4

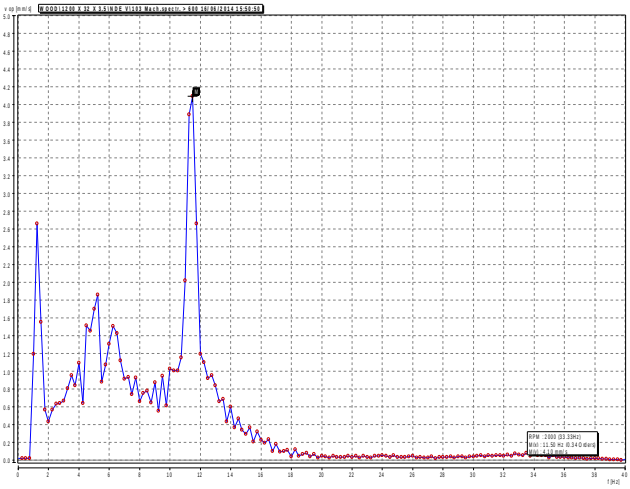

Figure-10.4: FRF graph for beam W-4

From Figure 10.1 beam of aluminium of the size 1200 X 32 × 3.5, the natural frequency corresponds to the peak response can be seen to be 1.50 Hz. The half power points where the response amplitude is equal to .707 times the peak response can be identified as ω_1 = 1.20 Hz and ω_2 = 1.80 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of aluminium corresponding to natural frequency 1.50 Hz is 0.2. The corresponding theoretical frequency for this beam comes out to be 1.07 Hz as compared to the experimental frequency of 1.50 Hz.

From Figure 10.2 beam of mild steel of the same size, the natural frequency corresponds to the peak response can be seen to be 2.00 Hz. The half power points can be identified as ω1 = 1.8 Hz and ω_2 = 2.2 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 2.00 Hz is 0.1. The corresponding theoretical frequency for this beam comes out to be 0.98 Hz as compared to the experimental frequency of 2.00 Hz.

From Figure 10.3 beam of stainless steel of the same size, the natural frequency corresponds to the peak response can be seen to be 1.75 Hz. The half power points can be identified as ω_1 = 1.60 Hz and ω_2 =2.00 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 1.75 Hz is 0. 114. The corresponding theoretical frequency for this beam comes out to be 0.97 Hz as compared to the experimental frequency of 1.75 Hz.

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From Figure 10.4 beam of wood of the same size the natural frequency corresponds to the peak response can be seen to be 1.25 Hz. The half power points can be identified as ω_1 = 1.1 Hz and ω_2 = 1.45 Hz. From analysis point of view resonant frequency response amplitude is very important. Since, the output can be viewed as frequency response function .Hence output response can be considered for analysis of damping for first mode. Hence the damping of specimen made up of mild steel corresponding to natural frequency 1.25 Hz is 0.14. The corresponding theoretical frequency for this beam comes out to be 0.78 Hz as compared to the experimental frequency of 1.25 Hz.

5.5 Tabulated Comparison of Theoretical And Experimental Natural Frequencies

BEAM DIMENSIONS (mm^3)	MATERIAL	$(\omega_n)_{Th.}=\frac{1}{2\pi}\sqrt{\frac{k}{m}}$ Hz	$(\omega_n)_{Exp.}$ Hz	% AGE ERROR	DAMPING RATIO (ζ)	LOSS FACTOR (η)
800 × 32 × 6.5	ALUMINIUM	4.11	7.00	41.29 %	0.0714	0.1428
	MILD STEEL	4.09	6.50	37.08 %	0.077	0.154
	STAINLESS STEEL	4.04	6.50	37.85 %	0.046	0.092
	WOOD	3.40	6.00	43.33 %	0.016	0.032
800 × 32 × 3.5	ALUMINIUM	2.21	3.00	26.33 %	0.133	0.266
	MILD STEEL	2.19	3.75	41.60 %	0.067	0.134
	STAINLESS STEEL	2.17	4.00	45.75 %	0.0375	0.075
	WOOD	1.75	2.25	22.22 %	0.044	0.088
1200 × 32 × 6.5	ALUMINIUM	1.83	3.00	39 %	0.1	0.2
	MILD STEEL	1.81	3.25	44.31 %	0.115	0.23
	STAINLESS STEEL	1.80	3.25	44.62 %	0.0615	0.123
	WOOD	1.45	2.00	27.50 %	0.162	0.324
1200 × 32 × 3.5	ALUMINIUM	1.07	1.50	28.67 %	0.2	0.4
	MILD STEEL	0.98	2.00	51 %	0.1	0.2
	STAINLESS STEEL	0.97	1.75	44.57 %	0.114	0.228
	WOOD	0.78	1.25	37.60 %	0.14	0.28

Table-3: Comparison of theoretical and experimental natural frequencies of different beams and % age error

5.6 Graphical Comparison Of Frequencies Of Beams Of Different Materials

5.6.1 Graphical Comparison of Natural Frequencies For The Beams Of 800 × 32 × 6.5

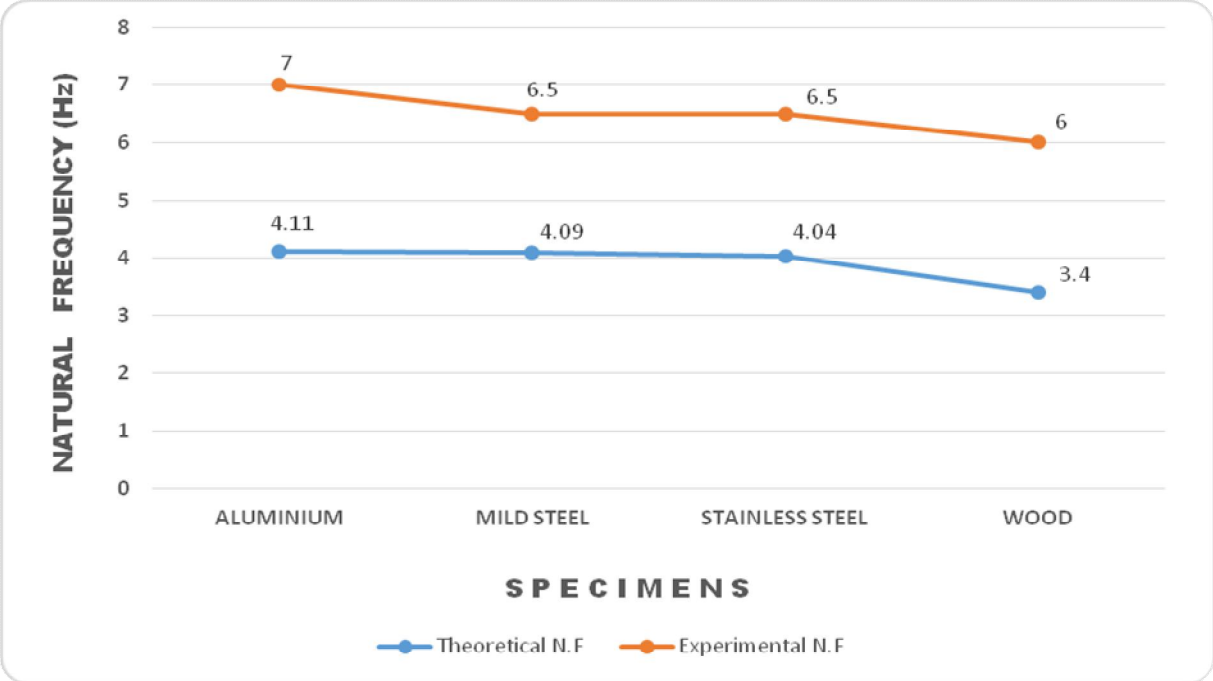

Figure-11.1: Comparison of natural frequencies for the beams of 800 × 32 × 6.5

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5.6.2 Graphical Comparison of Natural Frequencies For The Beams of 800 × 32 × 3.5

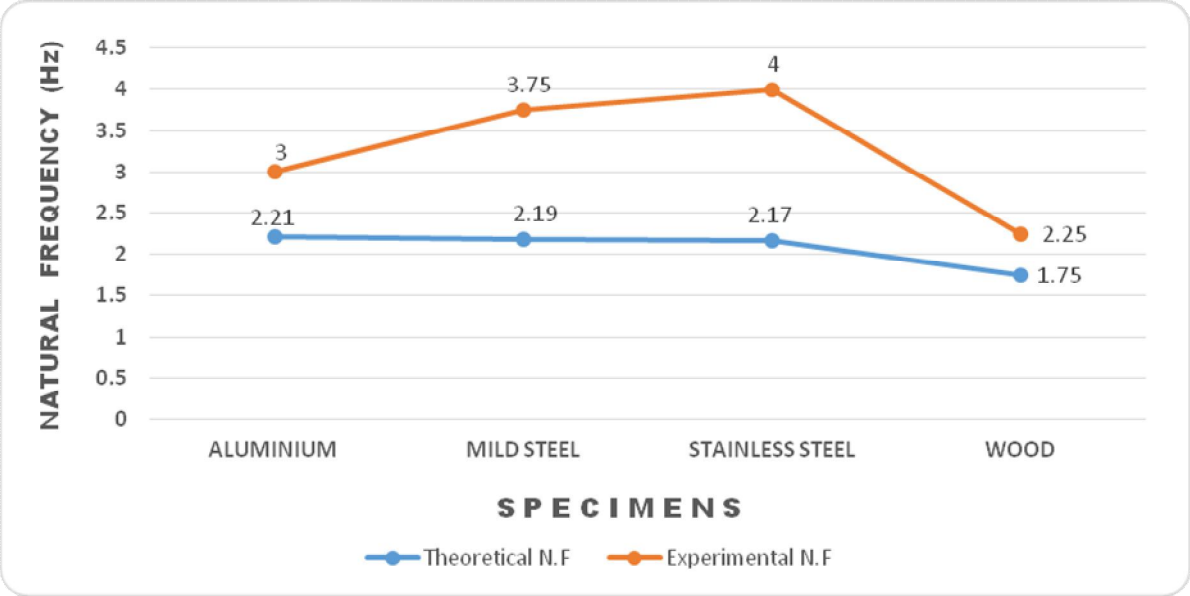

Figure-11.2: Comparison of natural frequencies for the beams of 800 × 32 × 3.5

5.6.3 Graphical Comparison of Natural Frequencies For The Beams of 1200 × 32 × 6.5

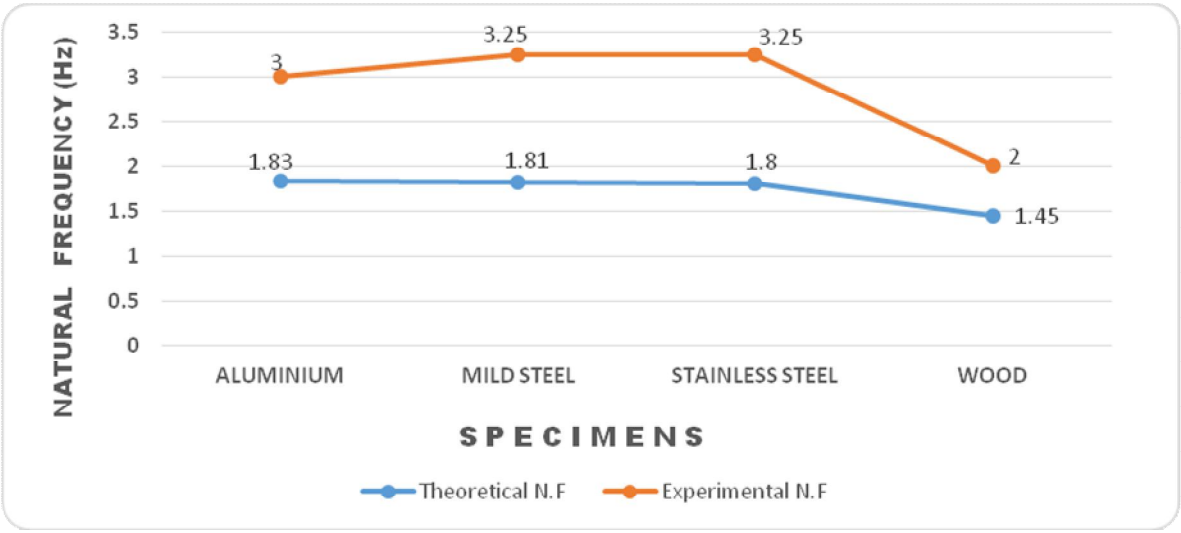

Figure-11.3: Comparison of natural frequencies for the beams of 1200 × 32 × 6.5

5.6.4 Graphical Comparison of Natural Frequencies For The Beams of 1200 × 32 × 3.5

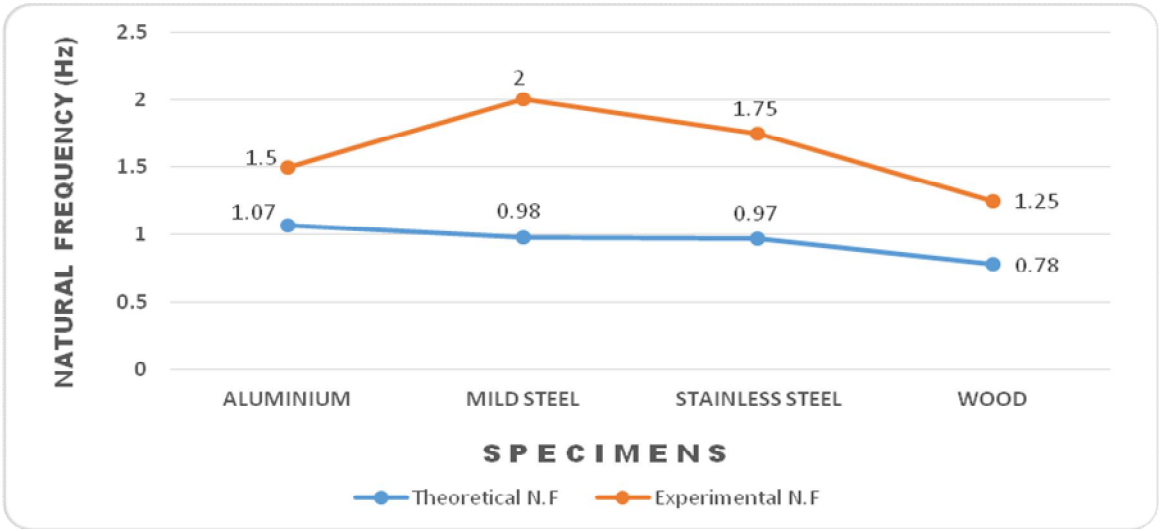

Figure-11.4: Comparison of natural frequencies for the beams of 1200 × 32 × 3.5

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5.7 Graphical Comparison Of *Loss Factors* Of Beams Of Different Materials

Now loss factor can be estimated as 2 times the damping ratio. In the following figures a graphical comparison has been shown material wise for beams of **800 × 32 × 6.5 mm^3, 800 × 32 × 3.5 mm^3, 1200 × 32 × 6.5 mm^3 and 1200 × 32 × 3.5 mm^3** dimensions.

5.7.1 Graphical Comparison of Loss Factors For The Beam of 800 × 32 × 6.5

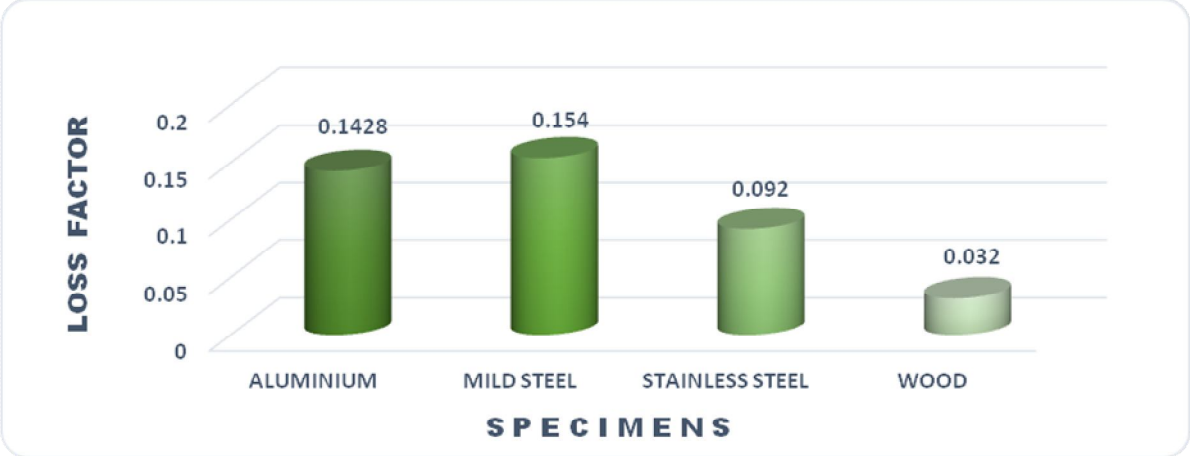

Figure-12.1: Comparison of Loss Factors for the beam of 800 × 32 × 6.5

5.7.2 Graphical Comparison Of Loss Factors For The Beam Of 800 × 32 × 3.5

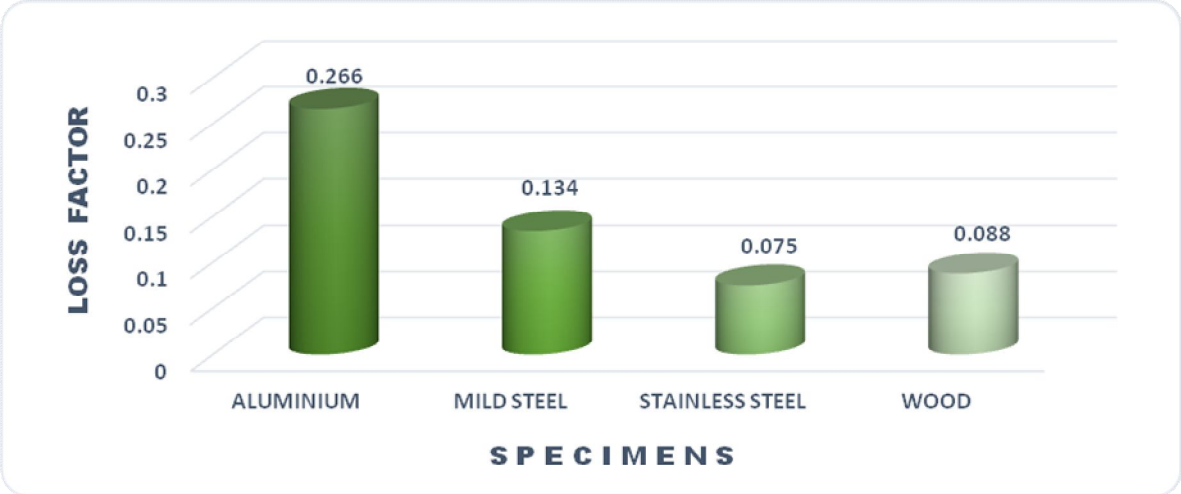

Figure-12.2: Comparison of natural frequencies for the beam of 800 × 32 × 3.5

5.7.3 Graphical Comparison of Loss Factors For The Beam of 1200 × 32 × 6.5

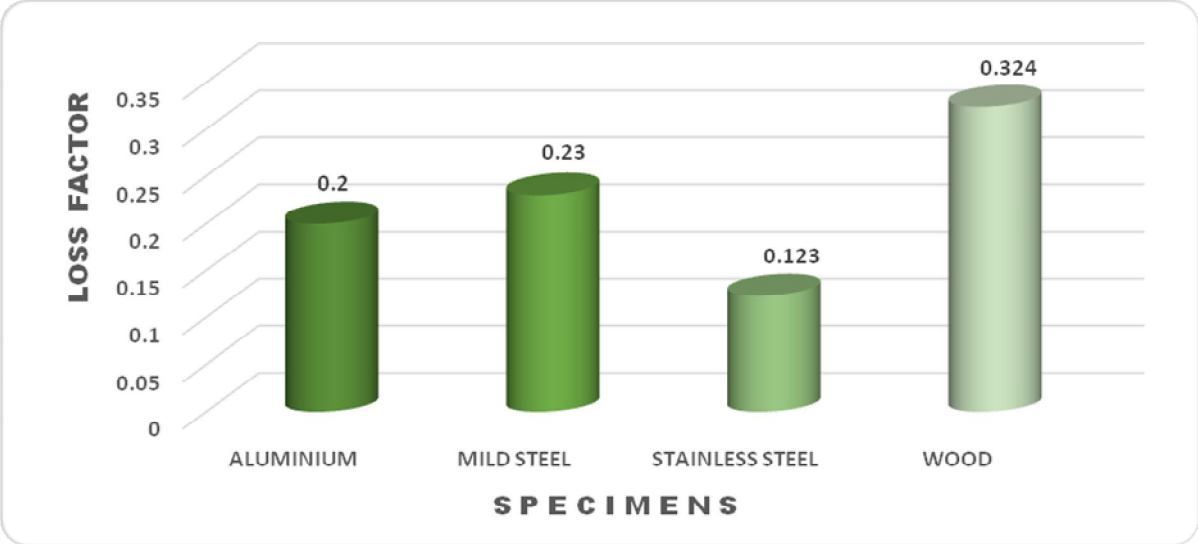

Figure-12.3: Comparison of natural frequencies for the beam of 1200 × 32 × 6.5

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5.7.4 Graphical Comparison of Loss Factors For The Beams of 1200 × 32 × 3.5

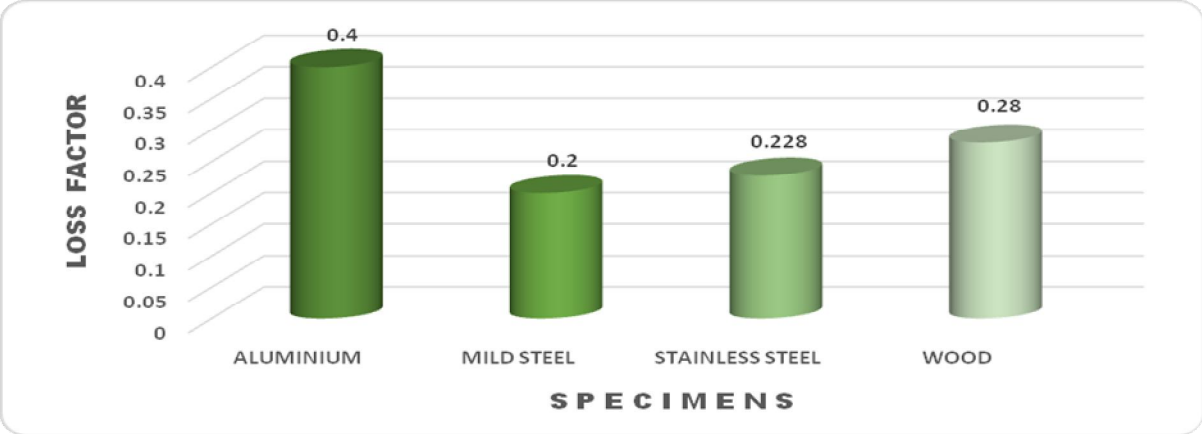

Figure-12.4: Comparison of natural frequencies for the beams of 1200 × 32 × 3.5

From the above figures it was clear that the loss factor of Mild Steel was maximum i.e. 0.154 which is in close comparison with aluminium i.e. 0.142, when the first type (800× 32 × 6.5) of beam was considered. When second (800 × 32 × 3.5) type of beam was taken into consideration the loss factor of aluminium was highest i.e. 0.266. Similarly for third (1200 × 32 ×6.5) and fourth (1200 × 32 × 3.5) type of beams, the wood and aluminium of 0.3.24 and 0.4 respectively have the highest loss factors. From figures 12.1 to 12.4 it may be concluded that aluminium has the maximum loss factor on an average. That's why aluminium is used in almost every construction because of its light weight, low cost and highest loss factor.

6. CONCLUSIONS

The main objective of the present work is to study the vibration damping characteristics of four materials i.e. aluminium, mild steel, stainless steel and wood. The data was collecting based on excitation frequency using free vibration technique and was compared with theoretical results. The cantilever beams had been subjected to impact hammer test and damping ratio had been computed using half power bandwidth method.

On the basis of present study following conclusions are drawn

- From the experiment it is evident that material damping is higher for aluminium in comparison with steel and wood.
- The increase in material damping could be correlated to the stiffness of materials.
- The damping ratio increases with decrease in thickness for each material.
- The natural frequency decreases with decrease in thickness for each material. But it is vice-versa in case of length.
- The damping of specimen made up of aluminium was found to be highest than either steel or wood.
- The theoretical result obtained by the method proposed in this work and experiment result vibrations are in fair matching in terms of natural frequency.

6.1 APPLICATIONS OF CANTILEVER BEAMS

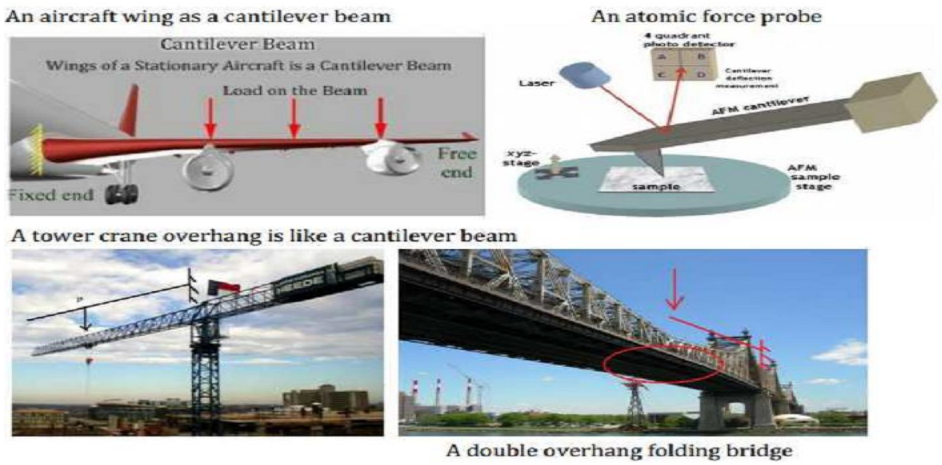

Figure-13: Beam applications in our daily life

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6.2 SCOPE FOR FUTURE WORK

The present work may be extended in one of the following ways. Areas in which the work can be further carried out in future are

» Use of tapered beams, variable thickness and length of beams

» There are also composite material beams i.e. metal matrix composite (MMC) in the use today.

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GROWTH OF INDIAN COMMERCIAL BANKING INDUSTRY DURING 1995-96 TO 2014-15

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ABSTRACT
Banks in India have been undergoing major challenges in the dynamic environment over the past few years as it is results of financial sector reforms. The Narasinham Committee (1991) recommendations enabled the entry of new private sector banks and foreign bank with increased competition, there arises an interest to study how strong and financially viable are the Indian banks, especially the public sector banks to withstand the ensuing competition?. The present study is mainly concerned with the analysis of comparative profiles of public banks and private banks in India during 1995-96 to 2014-15 that reflects the impact of new competitive environment on the bank's performance in terms of selected indicators. The study is based on secondary data collected from Indian Banks' Association (IBA) annual publications and the tools used for data analysis are Mean, Standard Deviation, Coefficient of Variation and Exponential Growth. To test the statistical significance of differences between public and private banks parametric and nonparametric tests are applied. The results of growth analysis have shown that the maximum progress of selected indicators has been recorded in private sector banks. The average growth of deposits and advances is not differing between the public sector and private sector while the growth of total income and total expenditure is significantly differs between public and private sector. Further, the study concludes that ownership is matters in case of Indian commercial banking industry. Private sector banks are idle banks for growth of public and foreign sector banks.

INTRODUCTION
The importance of banks in the process of economic development has been well recognized and the role of banks has become more important in planned or developing economies like India (Uppal, 2006). The most efficient bank generates the resource, allocates the resource in productive channels to contributes economic growth (Mohan, 2006) and plays a critical role in transmitting monetary policy impulses to the entire economic system (Kaur, 2010). Banks play a positive role in the economic development of a country as they not only accept and deploy large funds in a fiduciary capacity but also leverage such funds through credit creation (Aditi, 2011).

A safe and sound financial sector is a pre requisite for sustained growth through the mobilization of financial savings, putting them to productive use and thereby mitigating various risks (Pushpa, 2012). In the Indian financial system, commercial banks are the major mobilisers and disbursers of financial resources. They have pervasive role in the growth of developing countries. The role of banks in accelerating the economic development of a country like India has been increasing after the nationalization. The horizon of commercial banking in India that enlarged with nationalization has further widened with the implementation of the Banking Sector Reforms in the year 1992-93 (Choudhry, 2012).

The banking sector in India was totally traditional prior to 1991. The banks were usually risk averse and they thought banking is an activity of collecting deposits and lending against them. Until 1991 the word profitability was seldom considered by Indian banking business. In 1991 when government of India initialized the deregulatory policies, the Indian banking sector has gained momentum in diversified areas of development. After the globalization of Indian economy the Indian banking sector has made a tremendous progress in extending its functional reach (Sudha et al, 2013).

AN OVERVIEW OF THE INDIAN BANKING SECTOR
Banking in India originated in the last decades of the 18th century. The first banks were The General Bank of India, which started in 1786, and Bank of Hindustan, which started in 1790; both are now defunct. The oldest bank in existence in India is the State Bank of India, which originated in the Bank of Calcutta in June 1806, which almost immediately became the Bank of Bengal. This as one of the three presidency banks, the other two being the Bank of Bombay and the Bank of Madras, all three of which were established under charters from the British East India Company. For many years Presidency banks acted as quasi-central banks, as did their successors. The three banks merged in 1921 to form the Imperial Bank of India, which, upon India's independence, became the State Bank of India in 1955 (Kumar & Gulati2013). The process of financial development in independent India has hinged effectively on the development of banking system. Financing of emerging trade and industrial activities during 1950's and 1960's reflected the dominance of banking as the critical source. It is against this backdrop that the process of banking development was given impetus with the

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adoption of the policy of social control over banks in 1967, reinforced in 1969 by the nationalization of 14 major scheduled commercial banks. Since then, the banking system has formed the core of the Indian financial system (Singh, 2013). Reform of the financial sector was identified, from the very beginning, as an integral part of the economic reforms initiated in 1991. As early as August 1991, the government appointed a high level Committee on the Financial System (the Narasimham Committee) to look into all aspects of the financial system and make comprehensive recommendations for reforms. With effect of Narasimham Committee recommendations several new private banks have started operations and foreign banks have also been allowed to expand their branches more liberally than in the past (Ahluwalia, 1999). There are currently 27 public sector banks in India out of which 19 are nationalized banks and 6 are SBI and its associate banks, and rest two are IDBI Bank and Bharatiya Mahila Bank, which are categorized as other public sector banks. There are total 93 commercial banks in India including 23 private sector banks and 43 foreign banks (RBI, 2013). Present the Indian banking system consists of 26 public sector banks, 20 private sector banks, 43 foreign banks, 56 regional rural banks, 1,589 urban cooperative banks and 93,550 rural cooperative banks, in addition to cooperative credit institutions (IBEF, 2016).

REVIEW OF LITERATURE

Chawla (1988) analyzed the development and growth of banking activities after nationalization especially in the Punjab state during the period 1969-83. The study found that nationalization of major commercial banks in 1969 made a highly positive impact on deposit mobilization, credit deployment and branch expansion. **Ketkar (1993)** studied the impact of bank nationalization through aggressive bank branch expansion programs and priority sector credit allocation on India's financial savings, investment, productivity and GDP. The empirical findings indicate that the bank nationalization policy has been a mixed blessing. In their paper **Ramasastri & Samuel (2006)** made an attempt to analyze the trends in important banking indicators for the 25-year period from 1980 to 2005. They analyzed the data from balance sheets of banks, drawn some important conclusions for the banking sector as a whole as well as for different bank groups. The result revealed that compared to the pre-reform period, the public sector banks improved significantly after the initiation of reforms, although it is still lower as compared to foreign banks. **Al-Mamun (2012)** revealed the status of commercial banking activities in their trend towards universal banking practices in the respective countries. The result highlights that, there are significant difference between the status of Bangladeshi and Indian commercial banks trend toward universal banking. Thus the trend towards universal banking for Bangladeshi and Indian commercial banks is not going to be too rapid. **Khan and Fozia (2013)** examined the growth and technological development in Indian banking sector. Study concluded that the effective use of technology has a multiplier effect on growth and development in banking sector. **Rani et al (2013)** studied the performance and growth of different categories of Indian commercial banks during the period 2009 to 2012. The study found that during the global economic crisis the Indian commercial banks have shown a positive trend for development. It is observed that, during this period the SBI performed much better than the other public sector banks. **Manikyam (2014)** explained the changing banking scenario with the impact of economic reforms. The competition from global banks and technological innovation has compelled the banks to rethink their policies and strategies. Different products provided by foreign banks to Indian customers have forced the Indian banks to diversity and upgrade themselves so as to compete and survive in the market **Malyadri & Sirisha (2015)** compared the profiles of public banks, private banks and foreign banks in India during the period of 2006-13 that reflects the impact of new competitive environment on the bank's performance in terms of various selected parameters. The results have found strong evidence that the private sector banks surpasses the other bank groups and topped the position in all the parameters, while public sector banks and foreign banks are just competing for the 2nd and the 3rd position. **Vani et al (2016)** studied the performance of banks, through trend analysis. The result revealed that higher growth witnessed in new private sector banks but distribution of the variable are not stable whereas lower growth rates are recorded in state banks associate banks but the distribution of key indicators stable during the study period. **Mohan & Ray (2017)** traced the story of Indian financial sector over the period 1950–2015. According to them considerable competition has been introduced in the banking sector through new private sector banks and foreign sector banks, but public sector banks continue have a dominant share in the market. In modern financial sector, public sector financial institutions tend to compete with the private sector financial institutions.

NEED FOR THE STUDY

After the implementation of the first Narasinham Committee (1991) recommendations, which enabled the entry of new private sector banks and more liberal entry of foreign banks, commercial banks have become a heterogeneous group of institutions in terms of their ownership. Further, the structure of the banking sector has significantly changed due to deregulation and liberalization of financial sector. With increased competition,

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there arises an interest and a to study "How strong and financially viable are the Indian banks, especially the public sector banks to withstand the ensuing competition?" In this context, present study tries to evaluate the growth of the commercial banks which are considered as the backbone of our economy. Therefore, it is important to know the temporal behaviour of the banking companies from the point of view of the managerial and policy interests.

METHODOLOGY

The study is mainly based on secondary data collected from Indian Banks' Association (IBA) annual publications. The time period consider for this study is span of 20 years from 1995-96 to 2014-15. Hence, the study captures the effects of financial liberalization after two decades execution of financial reforms. The study employed the statistical tools like Arithmetic Mean, Standard Deviation, Coefficient of Variation and Exponential growth. Arithmetic average is the most common and widely used measure of central tendency (Kothari, 2004). Standard Deviation of a set of scores is defined as the square root of the average of the squares of the deviation of each from the mean (Singh, 2006). The coefficient of variation indicates the relative magnitude of the standard deviation as compared with the mean of the distribution as a percentage (Daniel et al, 2003). Exponential growth is a way to measure change reliably at any time or for any time difference (Tague et all, 1981). The objective of the t- test and f- test is to find out whether the independent estimates of population variance differ significantly across the groups (Gupta, 2007). The Kruskal-Wallis test is a nonparametric (distribution free) test, and is used when the assumptions of ANOVA are not met (Kanji, 2006). These three tests are employed in the study to test the statistical significance of key indicators of banking sector between ownership groups.

RESULTS AND DISCUSSION

Growth of Public Sector Banks

Deposits provide funds for investment and financing. Growth in customer deposits is a positive indicator of banking growth. Public sector banks accounted for the highest growth in Andhra Bank (23.6%) followed by Allahabad Bank (22.1%), Bank of Baroda (20.8%), Corporation Bank (19.1%), Oriental bank of Commerce (17.1%) and lowest in United Bank of India (13.9%). The higher coefficient of variation recorded in Bank of Baroda i.e., 106.68 percent and reveals that greater the level of dispersion around the mean. Advances can be arranged from bank in keeping with the flexibility in business operations and earns interest. On the basis of trends in total advances, the maximum growth rate witnessed by Corporation Bank (21.9%) followed by Andhra Bank (21.7%), Syndicate Bank (21.2%), UCO Bank (20.9%), Vijaya Bank (20.6%) and lowest in Dena Bank (17.1%). The coefficient of variation for advances ranged between 108.17 i.e., highest in Corporation Bank and lowest in State Bank of Patiala i.e., 89.85. The lower the value of the coefficient of variation in State Bank of Patiala indicate the more precise the estimate of dispersion. The total business is sum of deposits and advances and banks expands the business to meet financial needs of different segments of economy. It is observed from the data that the maximum growth rate of business witnessed in Andhra Bank (20.8%) subsequently Corporation Bank (20.1%), Allahabad Bank (19.9%), Bank of Baroda (19.0%) and Oriental Bank of Commerce (18.2%), UCO Bank (18.2%), Vijaya Bank (18.1%) and State Bank of Hyderabad (17.9%). The coefficient of variation for total business ranged between 107.12 i.e., highest in Bank of Baroda and 83.34 i.e., lowest in State Bank of Patiala (Table-1).

The total income of a bank depends upon the interest and discount earned, commission, exchange and brokerage and the other miscellaneous receipts. The growth of total income during the study period was recorded highest in Corporation Bank (17.1%) followed by Andhra Bank (16.4%), Allahabad Bank (15.9%), Oriental Bank of Commerce (15.7%), UCO Bank (15.4%), Vijaya Bank (15.4%), State Bank of Hyderabad (15.1%), and Union Bank of India (15.0%); and lowest in Dena Bank (12.2%). The growth rates of total income in remaining banks have been recorded ranging from 14.8 percent to 12.6 percent. The higher coefficient of variation recorded in Corporation Bank i.e., 101.1 percent and reveals that greater the level of dispersion around the mean and the lower coefficient of variation observed in State Bank of India i.e., 76.83 per cent. The total amount paid to the customers on their various deposits is called expenditure. The total expenditure incurred in bank is the sum of interest expanded and operating expenses. The growth of total expenditure during the study period was recorded highest in Corporation Bank (17.5%) followed by Andhra Bank (16.2%), Oriental Bank of Commerce (16.1%), Allahabad Bank (15.1%), State Bank of Patiala (15.0%), State Bank of Hyderabad (14.9%), Indian Overseas Bank (14.8%), Vijaya Bank (14.8%) and lowest in Indian Bank (11.0%). The growth rates of total expenditure in remaining banks have been recorded ranging from 14.7 percent to 11.9 percent. The coefficient of variation for total expenditure ranged between 106.61 i.e., highest in Corporation Bank 78.5 i.e., lowest in Indian Bank. The growth of net profits during the study period was recorded highest in Allahabad Bank (22.2%) followed by Indian Overseas Bank (19.6%), Syndicate Bank (19.4%), Andhra Bank (19.0%),

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State Bank of Hyderabad (17.6%), Union Bank of India (17.4%), Canara Bank (17.3%) and lowest in Indian Bank (8.7%). The growth rates of net profits in remaining banks have been recorded ranging from 16.9 percent to 10.5 percent. The coefficient of variation for net profits ranged between 95.94 i.e., highest in Punjab & Sind Bank 60.97 i.e., lowest in State Bank of Patiala (Table-2).

Growth of Private Sector Banks

One of the important performance parameters of commercial banks is deposits. The growth of deposits during the study period is recorded positive trend. Only two banks HDFC Bank (32.7%) and ICICI Bank (31.1%) are achieved relatively stronger growth with rate per year more than 30 percent. In addition, The RBL Bank (20.2%) and City Union Bank (20.2%) have grown more than 20.0 percent. The growth rates of deposits in remaining banks have been ranging from 19.2 percent to 11.4 percent. The coefficient of variation for deposits ranged between 206.95 i.e., highest in the Catholic Syrian Bank and 64.53 i.e., lowest in DCB Bank. Advances in banks are also known as loans. The income earned through advances is the main sources of income to banks. The growth of Advances during the study period was recorded positive trend. Only two banks HDFC Bank (36.8%) and ICICI Bank (35.0%) is achieved relatively stronger growth with rate per year more than 35 percent. In addition, The RBL Bank (24.1%), The Karnataka Bank (22.8%), City Union Bank (21.6%), Karur Vysya Bank (20.8%) and The South Indian Bank (20.2%) have grown more than 20.0 percent. The growth rates of advances in remaining banks have been recorded ranging from 19.6 percent to 13.5 percent. The coefficient of variation for advances ranged between 180.17 i.e., highest in the RBL Bank and 79.26 i.e., lowest in DCB Bank. The growth of total business during the study period was recorded positive trend. Only two banks HDFC Bank (34.2%) and ICICI Bank Ltd (32.6%) is achieved relatively remarkable growth per year more than 30 percent. In addition, The RBL Bank (22.1%) City Union Bank (20.7%), have grown more than 20.0 percent. The growth rates of total business in remaining banks have been recorded ranging from 19.3 percent to 12.2 percent. The coefficient of variation for total business ranged between 172.14 i.e., highest in the RBL Bank reveals that greater the level of dispersion around the mean and 70.46 i.e., lowest in DCB Bank indicate the more precise the estimate of dispersion (Table-3).

The growth of total income during the study period is recorded positive trend. As observed, during this period the growth of bank earnings was recorded highest in ICICI Bank (32.3%) followed by HDFC Bank (32.2%), RBL Bank (19.8%), City Union Bank (18.4%) and Indusind Bank (17.8%). The lowest growth was observed in The Catholic Syrian Bank (10.3%). The growth of total income in remaining banks has been ranging from 16.1 percent to 10.9 percent. The coefficient of variation in total income ranged between 179.15 i.e., highest in the RBL Bank and 65.97 i.e., lowest in DCB Bank. The growth of total expenditure during the study period was recorded positive trend. Only two banks HDFC Bank (32.4%) and ICICI Bank (30.5%) is achieved relatively stronger growth with rate per year more than 30 percent. The growth of total expenditure in remaining banks has been fluctuating from 19.6 percent to 10.4 percent. The coefficient of variation in total expense ranged between 179.81 i.e., highest in the RBL Bank and 60.9 i.e., lowest in DCB Bank. The growth of net profits during the study period was recorded highest in ICICI Bank (34.1%) then by HDFC Bank (27.9%), The South Indian Bank (23.1%), Nainital Bank (22.9%) and RBL Bank (22.2%). The lowest growth was observed in DCB Bank (3.3%). The higher coefficient of variation recorded in Dhanlaxmi Bank i.e., 173.11 percent and indicate that greater the level of dispersion around the mean (Table - 4).

The average growth of business indicators (Deposits, Advances and Total Business) and profit indicators (Total Income, Total Expenditure and Net Profit) of public sector banks (25 banks) and private sector banks (17 banks) is higher in private sector when compared to public sector during the study period. As per the standard deviation the growth of indictors is stable in public sector when compared to private sector. The total business of public sector banking is growing 17.4 per cent per annum while the net profit is 15.6 per cent. In the case private banking, the average growth of total business is found 19.1 per cent per year where as the net profit is 18.1 per cent (Table-5).

Panel - A of table presents the results of a series of t- Test and the null hypothesis of no difference in average growth of business and its distinct components are accepted in all the instances as calculated t-statistics are not significant. This indicates that the average growth of business not differ between the public sector and private sector. Panel - B of Table presents the results of f-Test, which also supports above inference that the there is no variance in growth of business in commercial banking industry between public sector and private sector. Panel - C provides the results pertaining to Kruskal -Wallis Test. We note that the null hypothesis is accepted in the entire instance as calculated test statistics are not significant statically. Hence, the study concludes that there is an identical distribution of growth in business between public sector and private sector (Table-6).

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To test whether the growth of profit indicators differs significantly between public sector and private sectors, we applied three statistical tests, namely, t-test, ANOVA test, and Kruskal -Wallis Test. The results of parametric and non-parametric tests as reported in Panel A, B and C of Table. The results confirm that there exists significant difference between public sector and private sector. The null hypothesis of no difference in average growth of profit indicators across distinct ownership groups is rejected in the case of total income and total expenditure; and concluded that there exists a significant difference in the growth of profit indicators belonging to distinct ownership groups. The growth of total income and total expenditure is significantly differs between public and private sector. Hence, we conclude that ownership matters in case of Indian commercial banking industry (Table – 7).

CONCLUSION

In public sector, the maximum growth of business was witnessed in Andhra Bank followed by Corporation Bank, Allahabad Bank, Bank of Baroda and Oriental Bank of Commerce. The growth of net profits during the study period was recorded highest in Allahabad Bank followed by Indian Overseas Bank, Syndicate Bank, Andhra Bank and State Bank of Hyderabad. In private sector, the growth of total business during the study period was recorded positive trend. Only two banks HDFC Bank and ICICI Bank Ltd is achieved relatively stronger growth with rate per year more than 30 percent. In addition, The RBL Bank and City Union Bank have grown more than 20.0 percent. The growth of net profits during the study period was recorded highest in ICICI Bank then by HDFC Bank, The South Indian Bank, Nainital Bank and RBL Bank. The lowest growth was observed in DCB Bank.

The results of growth analysis have shown that the maximum trend of selected indicators has been recorded in Private sector Banks. The Coefficient of Variation is the maximum in selected indicators has recorded private sector banks when compared to public sector banks and reveals that greater the level of dispersion. The total business of public sector banking is growing 17.4 per cent per annum while the net profit is 15.6 per cent. In the case private banking, the average growth of total business is found 19.1 per cent per year where as the net profit is 18.1 per cent. The results of statistical tests have revealed that the average growth of deposits and advances is not differing between the public sector and private sector while the growth of total income and total expenditure is significantly differs between public and private sector.

Finally, the study concludes that ownership is matters in case of Indian commercial banking industry. The private banking sector is outmost performed one. All key indicators are showing high level growth with consistency in the study period. These banks are idle banks for growth of public and foreign sector banks.

Table - 1: Trends in Total Business during 1995-96 to 2014-15 Public Sector

Sl. No	Bank Name	Deposits		Advances		Total Business	
		GR	CV	GR	CV	GR	CV
1	Allahabad Bank	0.221* (0.000)	95.69	0.204* (0.000)	102.24	0.199* (0.000)	98.25
2	Andhra Bank	0.236* (0.000)	98.28	0.217* (0.000)	105.16	0.208* (0.000)	101.12
3	Bank of Baroda	0.208* (0.000)	106.68	0.190* (0.000)	108.00	0.190* (0.000)	107.12
4	Bank of India	0.158* (0.000)	94.41	0.177* (0.000)	100.72	0.165* (0.000)	97.07
5	Bank of Maharashtra	0.154* (0.000)	84.35	0.198* (0.000)	103.81	0.170* (0.000)	92.09
6	Canara Bank	0.154* (0.000)	85.63	0.183* (0.000)	92.88	0.164* (0.000)	88.53
7	Central Bank of India	0.141* (0.000)	77.93	0.180* (0.000)	94.91	0.155* (0.000)	84.60
8	Corporation Bank	0.191* (0.000)	102.41	0.219* (0.000)	108.17	0.201* (0.000)	104.75
9	Dena Bank	0.150* (0.000)	90.75	0.171* (0.000)	99.15	0.158* (0.000)	94.06
10	Indian Bank	0.145* (0.000)	84.83	0.176* (0.000)	99.44	0.156* (0.000)	90.69
11	Indian Overseas Bank	0.156*	89.33	0.190*	100.58	0.169*	93.90

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		(0.000)		(0.000)		(0.000)	
12	Oriental Bank of Commerce	0.171* (0.000)	86.92	0.200* (0.000)	95.97	0.182* (0.000)	90.55
13	Punjab & Sind Bank	0.148* (0.000)	89.52	0.183* (0.000)	102.95	0.160* (0.000)	94.79
14	Punjab National Bank	0.161* (0.000)	87.91	0.196* (0.000)	99.32	0.174* (0.000)	92.66
15	Syndicate Bank	0.143* (0.000)	95.45	0.212* (0.000)	102.46	0.173* (0.000)	96.69
16	UCO Bank	0.168* (0.000)	86.99	0.209* (0.000)	97.15	0.182* (0.000)	91.03
17	Union Bank of India	0.161* (0.000)	89.08	0.196* (0.000)	100.52	0.174* (0.000)	93.86
18	United Bank of India	0.139* (0.000)	79.01	0.196* (0.000)	96.53	0.157* (0.000)	85.29
19	Vijaya Bank	0.168* (0.000)	90.03	0.206* (0.000)	99.95	0.181* (0.000)	93.87
20	State Bank of India (SBI)	0.144* (0.000)	80.47	0.182* (0.000)	96.93	0.159* (0.000)	87.46
21	State Bank of Bikaner & Jaipur	0.158* (0.000)	83.35	0.190* (0.000)	96.08	0.171* (0.000)	88.76
22	State Bank of Hyderabad	0.169* (0.000)	86.13	0.196* (0.000)	99.68	0.179* (0.000)	91.73
23	State Bank of Mysore	0.164* (0.000)	86.19	0.190* (0.000)	94.56	0.174* (0.000)	89.77
24	State Bank of Patiala	0.160* (0.000)	78.60	0.187* (0.000)	89.85	0.171* (0.000)	83.34
25	State Bank of Travancore	0.156* (0.000)	83.36	0.182* (0.000)	91.44	0.166* (0.000)	86.76

Source: annual reports various issues from 1994-95 to 2014-15, IBA, Mumbai.
Note: *significant at 1 per cent level and ** significant at 5 per cent level.
CV stands for coefficient of variation and GR stands for exponential growth rate.

Table - 2: Trends in Net Profit during 1995-96 to 2014-15 Public Sector

Sl. No	Bank Name	Total Income		Total Expenditure		Net Profit	
		GR	CV	GR	CV	GR	CV
1	Allahabad Bank	0.159* (0.000)	93.05	0.156* (0.000)	95.55	0.222* (0.000)	88.33
2	Andhra Bank	0.164* (0.000)	94.39	0.162* (0.000)	98.43	0.190* (0.000)	82.76
3	Bank of Baroda	0.134* (0.000)	88.36	0.130* (0.000)	88.63	0.169* (0.000)	95.43
4	Bank of India	0.139* (0.000)	87.79	0.138* (0.000)	89.91	0.149* (0.000)	80.85
5	Bank of Maharashtra	0.141* (0.000)	88.50	0.140* (0.000)	90.20	0.159* (0.000)	78.09
6	Canara Bank	0.140* (0.000)	84.19	0.137* (0.000)	86.26	0.173* (0.000)	78.96
7	Central Bank of India	0.128* (0.000)	80.69	0.128* (0.000)	83.26	0.136* (0.000)	79.09
8	Corporation Bank	0.171* (0.000)	101.10	0.175* (0.000)	106.61	0.121* (0.000)	75.29
9	Dena Bank	0.122* (0.000)	83.99	0.119* (0.000)	84.59	0.138* (0.000)	88.94
10	Indian Bank	0.137*	82.93	0.110*	78.50	0.087**	65.53

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		(0.000)		(0.000)		(0.016)	
11	Indian Overseas Bank	0.148* (0.000)	90.01	0.148* (0.000)	94.59	0.196* (0.000)	76.57
12	Oriental Bank of Commerce	0.157* (0.000)	87.70	0.161* (0.000)	91.66	0.105* (0.000)	66.96
13	Punjab & Sind Bank	0.134* (0.000)	86.90	0.128* (0.000)	87.85	0.154* (0.003)	95.94
14	Punjab National Bank	0.148* (0.000)	87.78	0.144* (0.000)	89.34	0.159* (0.000)	78.62
15	Syndicate Bank	0.147* (0.000)	85.41	0.145* (0.000)	85.76	0.194* (0.000)	85.83
16	UCO Bank	0.154* (0.000)	87.29	0.145* (0.000)	86.21	0.156* (0.000)	90.29
17	Union Bank of India	0.150* (0.000)	91.72	0.147* (0.000)	93.79	0.174* (0.000)	79.05
18	United Bank of India	0.129* (0.000)	79.92	0.124* (0.000)	83.51	0.154* (0.001)	94.50
19	Vijaya Bank	0.154* (0.000)	87.84	0.148* (0.000)	89.36	0.150* (0.000)	68.32
20	State Bank of India (SBI)	0.126* (0.000)	76.83	0.129* (0.000)	81.89	0.155* (0.000)	80.00
21	State Bank of Bikaner & Jaipur	0.136* (0.000)	81.02	0.135* (0.000)	81.54	0.157* (0.000)	77.46
22	State Bank of Hyderabad	0.151* (0.000)	88.02	0.149* (0.000)	88.83	0.176* (0.000)	83.91
23	State Bank of Mysore	0.142* (0.000)	82.68	0.140* (0.000)	84.56	0.163* (0.000)	74.30
24	State Bank of Patiala	0.148* (0.000)	81.77	0.150* (0.000)	84.77	0.118* (0.000)	60.97
25	State Bank of Travancore	0.136* (0.000)	82.40	0.134* (0.000)	85.15	0.157* (0.000)	77.84

Source: annual reports various issues from 1994-95 to 2014-15, IBA, Mumbai.
Note: *significant at 1 per cent level and ** significant at 5 per cent level.
CV stands for coefficient of variation and GR stands for exponential growth rate.

Table - 3: Trends in Total Business during 1995-96 to 2014-15 Private Sector

Sl. No	Bank Name	Deposits		Advances		Total Business	
		GR	CV	GR	CV	GR	CV
1	City Union Bank Ltd.	0.202* (0.000)	105.04	0.216* (0.000)	112.88	0.207* (0.000)	107.85
2	DCB Bank Ltd.	0.114* (0.000)	64.53	0.135* (0.000)	79.26	0.122* (0.000)	70.46
3	ING Vysya Bank Ltd.*	0.129* (0.000)	73.97	0.161* (0.000)	87.39	0.141* (0.000)	79.60
4	The Karnataka Bank Ltd.	0.160* (0.000)	82.16	0.228* (0.000)	93.94	0.171* (0.000)	86.63
5	Nainital Bank Ltd.	0.169* (0.000)	91.14	0.225* (0.000)	101.41	0.184* (0.000)	94.34
6	Tamilnad Mercantile Bank Ltd.	0.159* (0.000)	91.94	0.186* (0.000)	105.24	0.170* (0.000)	97.39
7	The Catholic Syrian Bank Ltd.	0.114* (0.001)	206.95	0.142* (0.000)	84.28	0.135* (0.000)	158.64
8	Dhanlaxmi Bank Ltd	0.159* (0.000)	93.80	0.173* (0.000)	101.00	0.164* (0.000)	96.55
9	The Federal Bank Ltd.	0.156*	84.37	0.170*	90.74	0.162*	86.98

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		(0.000)		(0.000)		(0.000)	
10	The Jammu & Kashmir Bank Ltd.	0.161* (0.000)	78.46	0.187* (0.000)	86.82	0.170* (0.000)	81.55
11	The Karur Vysya Bank Ltd.	0.192* (0.000)	110.07	0.208* (0.000)	110.01	0.193* (0.000)	113.23
12	The Lakshmi Vilas Bank Ltd.	0.163* (0.000)	94.25	0.180* (0.000)	99.73	0.170* (0.000)	96.49
13	RBL Bank	0.207* (0.000)	165.94	0.241* (0.000)	180.17	0.221* (0.000)	172.14
14	The South Indian Bank Ltd.	0.181* (0.000)	97.60	0.202* (0.000)	106.40	0.189* (0.000)	101.16
15	HDFC Bank Ltd.	0.327* (0.000)	121.14	0.368* (0.000)	130.37	0.342* (0.000)	125.09
16	ICICI Bank Ltd.	0.311* (0.000)	88.46	0.350* (0.000)	92.00	0.326* (0.000)	90.08
17	Indusind Bank Ltd.	0.176* (0.000)	96.13	0.196* (0.000)	112.54	0.184* (0.000)	103.25

Source: annual reports various issues from 1994-95 to 2014-15, IBA, Mumbai.
Note: *significant at 1 per cent level and ** significant at 5 per cent level.
CV stands for coefficient of variation and GR stands for exponential growth rate.

Table - 4: Trends in Total Business during 1995-96 to 2014-15 Private Sector

Sl. No	Bank Name	Total Income		Total Expenditure		Net Profit	
		GR	CV	GR	CV	GR	CV
1	City Union Bank Ltd.	0.184* (0.000)	110.56	0.186* (0.000)	116.22	0.221* (0.000)	109.16
2	DCB Bank Ltd.	0.109* (0.000)	65.97	0.114* (0.000)	60.90	0.033 (0.618)	125.09
3	ING Vysya Bank Ltd.*	0.122* (0.000)	81.58	0.122* (0.000)	79.44	0.141** (0.014)	108.63
4	The Karnataka Bank Ltd.	0.145* (0.000)	82.02	0.145* (0.000)	83.63	0.136* (0.000)	70.75
5	Nainital Bank Ltd.	0.161* (0.000)	92.25	0.154* (0.000)	91.82	0.229* (0.000)	97.89
6	Tamilnad Mercantile Bank Ltd.	0.144* (0.000)	91.67	0.144* (0.000)	92.41	0.148* (0.000)	88.82
7	The Catholic Syrian Bank Ltd.	0.103* (0.000)	71.26	0.104* (0.000)	73.81	0.104** (0.017)	82.33
8	Dhanlaxmi Bank Ltd	0.143* (0.000)	95.52	0.150* (0.000)	103.15	0.150* (0.003)	173.11
9	The Federal Bank Ltd.	0.147* (0.000)	84.92	0.140* (0.000)	84.25	0.219* (0.000)	99.09
10	The Jammu & Kashmir Bank Ltd.	0.151* (0.000)	82.66	0.149* (0.000)	83.51	0.176* (0.000)	88.26
11	The Karur Vysya Bank Ltd.	0.171* (0.000)	107.86	0.174* (0.000)	112.72	0.160* (0.000)	86.59
12	The Lakshmi Vilas Bank Ltd.	0.145* (0.000)	94.98	0.148* (0.000)	96.32	0.101* (0.001)	83.97
13	RBL Bank	0.198* (0.000)	179.15	0.196* (0.000)	179.81	0.222* (0.000)	171.43
14	The South Indian Bank Ltd.	0.160* (0.000)	99.33	0.152* (0.000)	103.77	0.231* (0.000)	107.83
15	HDFC Bank Ltd.	0.322* (0.000)	125.40	0.324* (0.000)	123.90	0.279* (0.000)	133.65

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16	ICICI Bank Ltd.	0.323* (0.000)	92.67	0.305* (0.000)	95.05	0.341* (0.000)	108.25
17	Indusind Bank Ltd.	0.178* (0.000)	113.72	0.178* (0.000)	110.44	0.182* (0.000)	140.37

Source: annual reports various issues from 1994-95 to 2014-15, IBA, Mumbai.
Note: *significant at 1 per cent level and ** significant at 5 per cent level.
CV stands for coefficient of variation and GR stands for exponential growth rate.

Table – 5: Average Growth of Indian Commercial Banking

Statistics → Variables ↓	Mean			Std. Deviation		
	Public Sector (N=25)	**Private Sector (N=17)**	**Total (N=42)**	**Public Sector (N=25)**	**Private Sector (N=17)**	**Total (N=42)**
Deposits	0.165	0.181	0.172	0.025	0.058	0.042
Advances	0.193	0.210	0.200	0.013	0.063	0.042
Total Business	0.174	0.191	0.181	0.014	0.059	0.040
Total Income	0.144	0.171	0.155	0.012	0.062	0.042
Total Expenditure	0.141	0.170	0.153	0.014	0.060	0.041
Net Profit	0.156	0.181	0.166	0.029	0.073	0.052

Table - 6 : Growth of Business Indicators between Public Sector Banks and Private Sector Banks - Hypothesis Testing

Measures	Deposits	Advances	Total Business
Panel A: t-test			
H_0 : *The mean growth of business between public sector and private sector banks is not different*			
t-statistics	1.247	1.287	1.444
p-value	0.220	0.205	0.156
Inference	**Accepted H_0**	**Accepted H_0**	**Accepted H_0**
Panel B: ANOVA			
H_0 : *There is no variance in growth of business between public sector and private sector banks*			
F-statistics	1.554	1.657	2.086
p-value	0.220	0.205	0.156
Inference	**Accepted H_0**	**Accepted H_0**	**Accepted H_0**
Panel C: Kruskal -Wallis Test			
H_0: *The distribution of growth in business between public sector and private sector banks*			
Test statistic	1.361	0.087	0.497
p-value	0.243	0.768	0.481
Inference	**Accepted H_0**	**Accepted H^0**	**Accepted H_0**
Source: Tables 1 & 3			

Table - 7 : Growth of Profit Indicators between Public Sector Banks and Private Sector Banks - Hypothesis Testing

Measures	Total Income	Total Expenditure	Net Profit
Panel A: t-test			
H_0 : *The mean growth in profit between public sector and private sector banks is not different*			
t-statistics	2.136*	2.332*	1.502
p-value	0.039	0.025	0.141
Inference	**Rejected H_0**	**Rejected H_0**	**Accepted H_0**
Panel B: ANOVA			
H_0 : *There is no variance in growth of profit between public sector and private sector banks*			
F-statistics	4.561*	5.438*	2.257
p-value	0.039	0.025	0.141
Inference	**Rejected H_0**	**Rejected H_0**	**Accepted H_0**

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Panel C: Kruskal -Wallis Test H_0: *The distribution of growth in profit between public sector and private sector banks*			
Test statistic	2.995**	4.208*	1.1243
p-value	0.084	0.040	0.265
Inference	**Rejected H_0**	**Rejected H_0**	**Accepted H_0**
Source: Tables 2 & 4. Note: *Significant at 5 per cent level &**Significant at 10 per cent level.			

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EFFECTS OF SOLUTION-FOCUSED BRIEF THERAPY AND ASSERTIVENESS TRAINING ON RESILIENCE ENHANCEMENT AMONG ADOLESCENTS AT-RISK BEHAVIOUR

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ABSTRACT
This study examined whether Solution-Focused brief therapy (SFBT) and assertiveness training will enhance resilience among adolescents at risk behaviour. Quasi-experimental, Pre-test, post-test, control group, research design was adopted for the study. Participants for the study were 60 first year undergraduate students, male and female between the ages of 17 and 18 years from University of Port Harcourt, Rivers State, Nigeria. Resilience scale (RS), and Risk-Taking and Self-Harm Inventory for Adolescents (RTSHIA) were used for data collection. Participants were randomly assigned to the three groups A, B and C. SFBT was used on group "A", assertiveness training on group "B" for 5 weeks while group "C" had nothing. T-test and one-way ANCOVA statistics were used for data analysis and the results shows that there were significance effects of the independent variables on resilience enhancement (the mean difference is Significant at p< 0.05 level). The implication from the study shows that the two independent variables were significant on enhancing resilience although SFBT had more result, but no gender effect on both. Discussion implores counsellors to include resilience enhancement program as part of orientation processes of new students for their proper adaptation in the university.

Keywords: Brief therapy, Assertiveness, Resilience, Adolescents, at-risk behaviour

INTRODUCTION
Transition from secondary school to the University is a world of difference for students especially those who are between the ages of 17 and 18 years. These students are still within the adolescent stage of development. Adolescents are typically experimenters and sometimes it leads them into behavioural problems. It has been observed that adolescents in Nigerian Universities are more at-risk in recent years due to the influence of profound cultural change (Laju, 2015). According to some definitions, adolescence may begin as early as seven years and extend to 18 through 22 years of age (Santrock, 1996). Other definitions describe it as lasting from age 12 to 18 years, or from completion of primary school to graduation from high school (Peterson, 2004). They experiment with lots of human behaviours including drug use and sex (Nwagu, 2016). On a sad note is that, some students have been unable to complete their university education for reasons ranging from peer pressure, cultism, drugs and alcohol abuse to pure laziness (Laju, 2015) which is sometimes connected with their quest for identity. It is very ridiculous that instead of fresh students to learn from such consequences, is not always the case. Many fresh students still fall victims of these vices especially those who are not resilient enough to with stand these at-risk behaviour pressures. Also, report say that only 25% of Nigerian University student live on campus (Laju, 2015) which means that for every student who live on campus, there are three others who face the stressful task of commuting to and from school every day. Staying off campus isn't just stressful, it could sometimes be dangerous

Furthermore, researchers has identified that apart from substance use, other risk behaviour in Nigerian schools include theft, bullying, suicide attempts, physical fighting, sexual intercourse, property damage, and gangsterism/cultism (Akanni, Koleoso, Olashore, Adayonfo, Adeagbo, Osundina, and Ayilara, 2017) The prevalence rates of some of these risk behaviours are still unknown (Adenike,Wusiu, & Olugbenga, 2009) and that was why this study advocated enhancing the students' resilience in order for the students to face the challenges in the university. Their stage of development has been identified to consist of dramatic transformations accompanied by several physiological, sexual behavioural, emotional and psychological changes; depressions, anxiety, restlessness and other obsessions which are reasonably observable during adolescence (Omoegun, cited in Edobor and Ekechukwu, 2014). In a very negative sense, risky behaviours are those with potential of having adverse effects on the overall development and well-being of youth (Guzman & Pohlmeier, 2014), and adolescents are at considerable risk to engage in these behaviours because of ongoing biological and social development. Thus, the purpose of this study was to quantitavely examine how to enhance the students' resilience to help with their adaptive processes.

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Thus, cultivating resilience is an important way to promote the psychological and social development of adolescents. Therefore, it is important to strengthen an individual's ability to adapt in his or her new environment. Therefore, enhancing students' resilience is an ambitious goal that aims to promote mental health and develop socio-emotional competence to enable them face some of those identified challenges in the university. Resilience was first conceptualized as a personal characteristic of at-risk children who appeared to do better than expected and the children were considered invulnerable (Garmezy, 1974; Werner, 1984). Resilient children were characterized by Garmezy (1974) as having high expectations, internal locus of control, self-esteem, self-efficacy, and autonomy in spite of disadvantages. Masten and Reed (2002) defined resilience as a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or risk. Studies have shown that the main difference between individuals who adapt very well despite facing risks and individuals who end up in maladaptation is the existence of protective factors. Thus, enhancing psychological resilience as protective factor of students may help them adapt to stressful and risky life situations found in the University. Masten and colleagues cited in Lee, Cheung, & Kwong, (2012) defined resilience as the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances. Also, another definition says that resilience refers to the capacity of a dynamic system to adapt successfully to disturbances that threaten the viability, the function, or the development of that system (Masten 2014a, 2014b). This definition facilitates the ability to think through and work together with students who are to face at-risk behaviours in the university. Furthermore, some experts have clearly distinguished three main aspects within the concept of resilience that characterized individual adaptation; the ability to achieve positive results in high risk situations, the ability to function competently in situations of acute or chronic stress, and the ability to recover from trauma (Truffino, 2010). Furthermore, from the literature it becomes clear that in operationalizing the concept resilience, three aspects are relevant, namely resistance, resilience and adaptivity. (Robertson, Cooper, Sarkar, and Curran, 2015). Resistance is the ability of a system to continue functioning when a disturbance occurs, without significantly changing the system suggesting that with resilience student should be able to achieve their goals. If functions are being affected, resilience is responsible for restoring the system's functioning. Adaptivity is the ability of a system to react to changes in their environment, to adapt and to learn from experiences (Robertson, Cooper, Sarkar, and Curran, 2015). According to Pooley and Cohen (2010) maintaining strong resilience in the face of academic and personal demands enables tertiary students to reach their potential and obtain satisfaction and enjoyment from their studies. Although it may not the direct role of a university to do so but supporting student resilience can contribute to improved academic outcomes and overall sense of fulfilment in the university experience which can easily be supported by students' institution of study.

From elicited literature, the University can really support the student adaptation in the school by enhancing students' resilience as a preventive model through psychotherapeutic interventions like Solution-focused brief therapy and assertiveness training. Solution-Focused Brief Therapy (SFBT) changes the focus of therapy from the problem to the solution, exploring a client's preferred future and using the client's resources and strengths to achieve that future. The model of Solution Focused Brief Therapy (SFBT), as developed by Steve de Shazer, Insoo Kim Berg and others at the Brief Family Therapy Centre in Milwaukee, Wisconsin, represented a further shift to future-oriented thinking (Kim, and Franklin, 2008). This approach also focuses more on the client's competencies and strengths rather than their deficits and weaknesses. The primary goal of SFBT is to resolve the presenting problem of the client by amplifying exceptions to the problems, or times that the client is not experiencing the problem, and identifying then Client's resources that are not being used toward the resolution of the problem. The focus is not on what's wrong with the client, but on what is right with them (Al Taher, 2015). The application of solution-focused brief therapy (SFBT) with students and in school settings has grown over the past 10 years and has been applied to a number of behavioural and academic problems (Kim, and Franklin, 2008). Furthermore, Solution-focused brief therapy (SFBT) is a strengths-based intervention that is founded in the belief that it is important to build on the resources and motivation of clients because they know their problems the best and are capable of generating solutions to solve their own problems (Miller & de Shazer, 2000).

Assertiveness training in other hand is a substantial communication style that enhances successful relationships with families and colleagues (Mahmoud, Kalaldeh, and Abed, 2013). Assertiveness is an expression of self-esteem. There are many benefits of being assertive such as better time management, increased self-esteem and the ability to negotiate more effectively (Abed et al. 2015). Studies have shown that individuals who have assertive behaviours generally have higher self-worth and are more successful in life. Assertive persons maintain self-respect and respect others. According to Wolpe (1969), assertive training will help persons who have adaptive responses. The training programs essentially include the following steps: (1) situation appraisal to

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determine what the rights and responsibilities are of the various parties involved and the probable consequences of various courses of action; (2) experimentation with new behaviours and attitudes in practice situations; (3) behaviour evaluation to determine experienced anxiety, verbal content and delivery of message, and overall performance; and (4) behaviour implementation (Galassi and Galassi, 1977). Assertive individuals claim their own rights, make requests of others, can say no to things they do not want, accept praise and easily verbalizes their feelings. Assertive training program is a systemic approach to more assertive self-expression, based on a balance between achieving one's own goals and respecting the needs of others. It is a psychological intervention which helps participants learn to integrate assertive behaviour skills into their daily lives which in other hand enhances their resilience and thus help them in their adaptive processes. The psychological concept of assertiveness covers three major principles of human expression: behavior, cognition, and emotion. From the behavioral aspect, assertiveness is the skill that enables a person to freely express his feelings, defend his objectives and goals in ordinary and special circumstances, and have a sense of accomplishment and success in interpersonal relationships (Townend, cited in Hojjat, Golmakani, Khalili, Chenarani, Hamidi, Akaberi, and Ardani, 2016).

This study was designed more heavily on social learning theory. According to Bandura (2003), portraying that humans have evolved an advanced cognitive capacity for observational learning that enables them to shape and structure their lives through the power of modelling. Social learning theory (Bandura, 1986) offers the explanation that people learn by observing others and then imitating that behaviour. Bandura suggests that people use symbols as internal models to guide their behaviour and as a means for estimating outcomes of their actions and through practices and experiences they can facilitate self-efficacy. Counselling groups provide an atmosphere of acceptance, encouragement and safe experimentation for new behaviours. In addition since peers strongly influence the young adolescent, group counselling enhances the possibility that adolescents will attempt new behaviours practiced and modelled by their peers and significant others (Çeçen-Erogul and Zengel, 2009).

In conclusion, the researchers believe that if psychological resilience of students at risk-behaviours were enhanced, they should be able to achieve their academic goals no matter the challenges they are facing in the University. From literature, resilience has been discovered as a major theme in developmental psychopathology focusing on the question why some children and adolescents maintain positive adaptation in a distressing life conditions and demanding societal conditions. Therefore, the problem of the study is, "of what effect will Solution-focused Brief Therapy and assertiveness training have on resilience enhancement among adolescents At-risk behaviour". It was in an effort to solve the stated problem of students at risk-behaviour that this study was carried out and in so doing the researchers have contributed to knowledge.

This study was guided by three research questions and three corresponding hypotheses thus

1. What is the effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour in the experimental group based on their pretest, post-test scores from Resilience scale (RS)?
2. What is the effects of assertiveness training on resilience enhancement among adolescents at-risk behaviour in the experimental group based on their pretest, post-test scores from Resilience scale (RS)?
3. What is the difference in resilience enhancement among adolescents at-risk behaviour in the two independent variables, SFBT and assertiveness training in experimental groups and control group based on their pretest, post-test scores on Resilience scale (RS)?

The corresponding hypotheses were as follows

1. There is no significant difference effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)
2. There is no significant difference effects of assertiveness training (AT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)
3. There is no significant difference effects in resilience enhancement among adolescents at-risk behaviour in the two independent variables, SFBT and AT experimental groups and control group based on their pretest post-test scores on Resilience scale (RS)

METHODOLOGY

Quasi-experimental, pre-test, post-test, control group, research design was adopted for the study. The three-group quasi-experimental design was most suitable for the study which consists of two independent variables

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(Solution-Focused brief therapy (SFBT) and assertiveness training) and a dependent variables (enhance resilience among adolescents at risk behaviour). In notational form, three-group quasi-experimental design is as illustrated in figure 1 having two experimental groups and one control group.

Groups	Types of treatment	Pre-test	Treatment	Post-test
1	SFBT	0_1	X_1	0_2
2	Assertiveness Training	0_3	X_2	0_4
3	Control	0_5		0_6

Pre-test (0_1, 0_3, 0_5); Treatment (X_1, X_2); Post-test (0_2, 0_4, 0_6)

Fig-1: Illustration of three-group quasi-experimental design.

The population for this study consisted of all 150 first year undergraduate students, male and female between the ages of 17 and 18 years from three departments in faculty of Education University of Port Harcourt, Rivers State, Nigeria. The 3 departments were selected through balloting out of 8 departments in the faculty education. A purposive sampling was applied to draw 60 students from the 3 departments while balloting was used to put them into 3 groups of 20 students in each which consisted of 2 experimental groups and 1 control group. The first group had Solution-focused brief therapy and the second group had assertiveness training while the third group had nothing. The treatment with the two experimental groups lasted for three weeks.

Two instruments were used for data collection, Resilience Scale (RS) and Risk-Taking and Self-Harm Inventory for Adolescents (RTSHIA). Resilience scale was adopted from the Resilience Scale which is an international trademark of Wagnild and Young (1993) and was used for the pre-test and post-test of the study while Risk-Taking and Self-Harm Inventory for Adolescents (RTSHIA) was adapted from Vrouva, Fonagy, Fearon, and Roussow (2010), was as a take-off assessment of the participants. Resilience Scale is a seven point scale (1, 2, 3, 4, 5, 6, 7) ranging from "1" (Strongly Disagree) on the left to "7" (Strongly Agree) on the right. The respondents are supposed to circle the number which best indicates their feelings about that statement. If the individual strongly disagree with a statement, he or she will circle "1", if neutral, the individual will circle "4", and if strongly agree, they will circle "7". The lowest score is 25 while the highest score is 175. The RTSHIA selected 38 questions to tap into Risk-taking (RT) and Self-Harm (SH) in both direct and indirect ways which include alcohol misuse, adolescent injuries, substance abuse, smoking tobacco and taking chances while doing one's hobbies, to serious risk-taking, such as participating in gang violence and putting oneself at risk of sexual abuse. Questionnaire asks about a number of different things that young people sometimes do. The test-retest reliability of both instruments were high scoring .85 and .93 respectively. Data were analysed using IBM SPSS Statistics 21 at 0.05 level of significant.

TREATMENT PROGRAMS

Treatment Stages

Stage1:- Introduction. Meeting with the would-be participants from each of the three departments of the faculty of education. This was to familiarize them with the mission and the objective of the researchers, and the benefits for the individual participants. Pretest was administered using Resilience scale (RS), and Risk-Taking and Self-Harm Inventory for Adolescents (RTSHIA). The scores obtained from RS was served as pre-treatment score while scores obtained from RTSHIA served as pretreatment diagnostic score used to identify at-risk behaviour. Participants were randomly assigned into three groups. Time and days of meeting sessions were agreed on.

Stage 2: Intervention program with the experimental groups, where the researchers used SFBT on group "A", assertiveness training on group "B" for 5 weeks of 5 sessions, while group "C" had nothing. The two treatment packages were well administered to the participants.

Stage 3: Evaluation of the treatment intervention to examine the outcome of the study. After the treatment program of 5 weeks RS was re-administered to the three groups to determine the effectiveness of the treatment interventions.

Treatment Sessions

SFBT Treatment Sessions

- Session One: Introductions – Getting to know each other, Problem-free talk - rational and devise group rules, identifying where their resilience is in a scale of 0 – 100, Set goals -setting of specific, concrete, and realistic goals Assign homework.

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- Session Two: Review previous session, constructing useful steps to reach preferred futures, Exception finding and scaling questions - Fundamental to the solution-focused approach is a belief that no matter how severe or all-pervasive a person's problem may appear there will be times when it does not occur - Link goals to academic achievement, Assign homework
- Session Three: Review previous session and homework, from the list of at-risk behaviour, Strength seeking questions were used to highlight coping skills, Motivational enhancement interviewing, not letting their feeling be their master.
- Session Four: Review previous session and home-work, Miracle question for student to highlight their preferred future, Present and future-focused questions vs. past-oriented focus Presupposing change, Coping and miracle question.
- Session Five: Review previous session and home-work, Exception finding, Use of extensive questioning about previous solutions and exceptions, Revision, feedback. The therapist has to make sure that the participants understand the importance of continuing to practice the strategies they learnt in the therapy. The aim of SFBT is to empower individuals to always focus on the solution rather than the problem. The participants discussed their concerns with the therapist and final termination of the therapy.

Assertiveness training treatment sessions

- First Session: Introduction; what the assertive training is all about and what is expected of them in the training program, and setting goal.
- Second Session: passive behaviour and its consequences, aggressive behaviour and its characteristics, assertive behaviour and its characteristics, how to make an explicit request to make people help them feel better, how to clarify and specifically state what they want.
- Third session: identifying passive, aggressive and assertive behaviour and role play how to stand up for their right, Be aware of their entitlements and assumptions, Clarify their understanding from others' request, benefits of assertive behaviour in building their resilience.
- Fourth session: Retain the power to say 'No', Role-play and practice how to say 'NO' to unreasonable request, how to react to criticism and practice assertive communication skills.
- Fifth session: Revision, Evaluation, and feedback

RESULTS

Results of statistical analysis of the research questions and hypotheses are presented in the following tables

Research question 1: What is the effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour in the experimental group based on their pretest, post-test scores from Resilience scale (RS)?

Table-1: presents Mean and Standard Deviation of the effects of SFBT on Exp. group A

SFBT Exp. Group A	Mean($\bar{X}$	N	Std. Deviation	Std. Error Mean
Pre-test	73.600	20	8.6231	1.92818
Post-test	126.500	20	14.940	3.34074

The result on the table 1 shows that the post-test mean ($\bar{X}$) scores ($\bar{X}$ =126.500) is higher than their pre-test mean ($\bar{X}$) scores ($\bar{X}$ = 73.600) on RS. The result reveals that there is effect of Solution Focused Brief Therapy (SFBT) on enhancement of resilience among students at risk behaviour based on their pre-test post-test scores. Furthermore the SD values of 14.940 for the post-tests suggest that the responses or the scores of the respondents between the pre-test and post-test are widely spread from the mean.

Research question 2: What is the effects of assertiveness training on resilience enhancement among adolescents at-risk behaviour in the experimental group based on their pretest, post-test scores from Resilience scale (RS)?

Table-2: presents Mean and Standard Deviation of the effects of AT on Exp. group B

AT Exp. Group B	Mean($\bar{X}$)	N	Std. Deviation	Std. Error Mean
Pre-test	71.500	20	9.45627	2.11449
Post-test	115.000	20	12.16553	2.72029

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The result on the table 2 shows that the post-test mean ($\bar{X}$) scores ($\bar{X}$ = 115.00) is higher than their pre-test mean ($\bar{X}$) scores ($\bar{X}$ = 71.500) on RS. The result reveals that there is effect of Assertiveness training (AT) on enhancement of resilience among students at risk behaviour based on their pre-test post-test scores. Secondly, the SD values of 12.16553 for the post-tests suggest that the responses or the scores of the respondents between the pre-test and post-test are widely spread from the mean

Research question 3: What is the difference in resilience enhancement among adolescents at-risk behaviour in the two independent variables, SFBT and assertiveness training in experimental groups and control group based on their pretest, post-test scores on Resilience scale (RS)?

Table-3: presents Mean and Standard Deviation of the resilience enhancement of the three groups

Groups	Mean($\bar{X}$)	N	Std. Deviation	Std. Error Mean
Ex. SFBT Group	126.500	20	14.94023	2.550
Ex. AT Group	115.000	20	12.16553	2.499
Control Group	73.000	20	7.14511	2.493

The result on the table 3 shows that students in SFBT post-test mean ($\bar{X}$) scores ($\bar{X}$ = 126.500) and Standard deviation value 14.94023. Students in AT had post-test mean ($\bar{X}$) scores ($\bar{X}$ = 115.000) and Standard deviation value of 12.16553. Students in Control group had post-test mean ($\bar{X}$) scores ($\bar{X}$ = 73.000) and Standard deviation value of 7.14511. The individual responses in resilience enhancement of students in SFBT and AT widely deviated from the mean more than those in Control group.

Hypothesis 1: There is no significant difference effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)

Table-4: Presents Paired Samples t-test showing the effects of SFBT on resilient enhancement of experimental group A

SFBT Group	Mean	Sample	Std. Dev	df	r	t	P-Value	Remark
Pre-test	73.6	20	8.6231					
				19	0.138	14.616	.000	Sig
Post-test	126.5	20	14.9402					

Table 4 shows pre-test and post-test of students in SFBT experimental group had their mean scores 73.6 and 126.5 respectively. The standard deviation of their pre-test is 8.6231 and 14.9402 for post-test. From the table $t(19)= 14.616$ $p < .001$. There is statistically significant difference from the students' pre-test scores and post-test score showing their resilience enhancement. Therefore the above hypothesis which says that "there is no significant difference effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)" is rejected as p value = p< .000 at a chosen alpha of 0.05.

Hypothesis 2: There is no significant difference effects of assertiveness training (AT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)

Table-5: Presents Paired Samples t-test showing the effects of AT on resilient enhancement of experimental group B

AT Group	Mean	Sample	Std. Dev	df	r	t	P-Value	Remark
Pre-test	71.5	20	9.45672					
				19	0.341	15.433	.000	Sig
Post-test	115	20	12.16553					

Table 5 shows pre-test and post-test of students in AT experimental group mean scores 71.5 and 115 respectively. The standard deviation of their pre-test is 8.6231 and 14.9402 for post-test. From the table $t(19)= 15.433$ $p < .000$. There is statistically significant difference from the students' pre-test scores and post-test score showing their resilience enhancement. Therefore the above hypothesis which says that "there is no significant difference effects of Assertiveness training on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)" is rejected as p value = p< .000 at a chosen alpha of 0.05.

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Hypothesis 3: There is no significant difference effects in resilience enhancement among adolescents at-risk behaviour in the two independent variables, SFBT and AT experimental groups and control group based on their pretest post-test scores on Resilience scale (RS)

Table-6: presents Analysis of covariance (ANCOVA) showing resilience enhancement of the two independent variables SFBT and AT on experimental group A, B and control group

Source of Variance	Sum of Squares	df	Mean Square	F	Sig
Variable Controlled					
(pre-test scores)	1061.195	1	1061.195	8.536	0.005
Intercept	4166.181	1	4166.181	33.512	000
Main effect	31421.591	2	15710.796	126.376	000
Error	6961.805	56	124.318		
Total	39746.333	60			

The result in table 6 shows that F(2, 56) = 126.376, p = 000. Between groups are presented in main effect (VAR00003) rows and while within groups presented in Error rows. In main effect rows, Type III Sum of Squares 31421.591, 2 degree of freedom, 15710.796 Mean Square , 126.376, 2 F ratio and p= .000 significance. The Error has type sum of square of 6961.805, degree of freedom of 56 and mean square of 124.318. The computed ANCOVA coefficient (F) is 8.536 and is statistically significant at possible chosen alpha level of .05 with its actual probability in the population is as low as .000. Therefore, with the effect of the Pre-test covaried out, adjusted for, removed or partialled out, the hypothesis of no significant difference in the effect of both SFBT and AT on resilience enhancement among adolescents at-risk behaviour based on their Pre-test, Post-test scores as stated in hypothesis 3, as this is rejected both at .05 and .01 levels of significance. There is statistically significant means difference among the experimental groups and control group because F (2, 56) =, $p < .05$.

DISCUSSION OF RESULTS

The main purpose of this study was to examine whether Solution-Focused brief therapy (SFBT) and Assertiveness (AT) training will enhance resilience among adolescents at risk behaviour. The results, among others, reveal that there is significant effects of Solution-Focused brief therapy (SFBT) and Assertiveness (AT) training on enhancing resilience among adolescents at risk behaviour.

With regards to hypothesis one, the results obtained as presented in Tables 1, indicate a significant difference in the result. The results from the findings reveal that null hypothesis 1 is rejected. Table 4 shows pre-test and post-test of students in SFBT experimental group having their mean scores 73.6 and 126.5 respectively. The standard deviation of their pre-test is 8.6231 and 14.9402 for post-test. From the table t(19)= 14.616 $p < .001$. There is statistically significant difference from the students' pre-test scores and post-test score showing their resilience enhancement. Therefore the above hypothesis which says that "there is no significant difference effects of solution-focused brief therapy (SFBT) on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)" is rejected as p value = p< .000 at a chosen alpha of 0.05. This has shown the positive outcome of SFBT which is in line with Franklin, Streeter, Kim, and Tripodi (2007) in their study of 85 At-risk high school students with SFBT intervention and this showed statistically significant higher average proportion of credits earned to credits attempted than the control sample. Although both groups decreased in the attendance mean per semester, but however, the experimental group showed a higher proportion of school days attendance for the semester. Graduation rates also favoured experimental group (90% to 62%). This confirms SFBT being suitable in the school settings

Froeschle, Smith, and Ricard (2007) also studied 8th grade 65 females students from middle school, on substance abuse, Statistically significant differences were found favouring SFBT group on drug use, attitudes towards drugs, knowledge of physical symptoms of drug use, and competent behaviour scores as observed by both parents and teachers. No group differences were found on self-esteem, negative behaviours as measured by office referrals, and grade point averages. Furthermore, Gingerich & Peterson (2013) conducted a qualitative review of 43 controlled outcome studies on SFBT and concluded that SFBT is an effective approach with many different psychosocial conditions with children/adolescents and adults. Meta-analysis and systematic reviews of experimental and quasi-experimental studies indicate that SFBT is a promising intervention for youth and adults with internalizing disorders and behaviour problems. More also, SFBT has also been frequently used with school and academic problems, showing medium to large effect sizes (Gingerich & Peterson, 2013; Kim, 2013; Kim & Franklin, 2008).

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SFBT may be useful for school-based professionals because SFBT is usually a brief intervention that tries to engage and focus on quick change with children, families and teachers. Furthermore, many school-based professionals deliver their services to students who have yearly goals for treatment, usually through an Individualized Education Plan (IEP). SFBT is well-suited to helping school-based professionals write those goals and collaborate with their students to meet those goals successfully. Franklin and Gerlach (2007) summarize other reasons why SFBT may be gaining popularity in public school settings. For example, public schools frequently serve high-risk populations such as homeless teens, immigrants, and teen parents. Many children referred for therapy in the school may also be considered mandated or involuntary clients and SFBT is a therapy that was developed for the purposes of being effective with involuntary client populations (Franklin & Hopson, 2008).

In addition, Positive results were achieved with adolescents suggesting that SFBT may be used effectively with both older children and adolescents. While SFBT shows promising findings, school-based professionals and researchers must work to provide more studies on this approach if a strong evidence-base is to be developed, especially with a grade point averages outcome since there were some non-significant and mixed results found in this review

A review of the outcome literature of SFBT in schools found mixed results but showed promise as a useful approach to working with at-risk young students within a school setting, given the positive outcomes regarding externalising problem behaviours (Kim & Franklin, 2009). However, the authors conclude that they were unable to come to any definitive conclusions about SFBT as an effective intervention. Although, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) rated SFBT as a promising intervention (Kim, Smock, Trepper, Mccollum, & Franklin, 2010).

Also hypothesis 2 presented in table 5 showed significant difference resulting from the scores obtained. Table 5 shows pre-test and post-test of students in AT experimental group mean scored 71.5 and 115 respectively. The standard deviation of their pre-test is 8.6231 and 14.9402 for post-test. From the table $t(19)= 15.433$ $p < .000$. There is statistically significant difference from the students' pre-test scores and post-test score showing their resilience enhancement. Therefore the above hypothesis which says that "there is no significant difference effects of Assertiveness training on resilience enhancement among adolescents at-risk behaviour based on their pretest, post-test scores from Resilience scale (RS)" is rejected as p value = $p< .000$ at a chosen alpha of 0.05. The result showed that assertiveness training is significant in enhancing resilience. The study agrees with that of Agbakwuru, and Ugwueze, (2012) who investigated 24 students aged 10-12 years. Pre-test post-test experimental and control group design was used with some observation also made. Randomisation assignment was used to draw the 14 (8 male and 6 female) students to experimental and 10 (male and female) student to control groups. The summary of the research questions and hypothesis answered showed that there was positive effect of assertiveness training on improvement of resilience on respondents. The assertiveness training showed more improvement on resilience of the girls than that of the boys. From the statistical analysis, we conclude that the assertive training has been able to improve the level of resilience on the experimental group. This result shows that both the male and female was affected equally by the assertiveness training. There were higher scores from the experimental group and for that they attributed it to the effect of assertive training on them. The observation carried out by the researcher and the teachers has a positive outcome also. This shows that assertiveness is effective in enhancing the resilience of both pre-adolescents and adolescents.

Research on the effects of assertive training has reported increased self-esteem, increased positive reaction from others, and reduced anxiety in social situations for persons having gone through a training program. However, most research has dealt with treatment for sexual deviations (Stevenson and Wolpe, 1970; Edwards, 1972; Lazarus, 1971). Working together as a group, develop better and better responses to situations of conflict (high risk, provocative, anxiety-provoking), while establishing a supportive peer culture. Assertiveness training was found to be effective in improving the social coping skills of general populations of adolescents (Rotheram ve Armstrong, 1980; Howing, Wodarski, Kurtz, & Gaudin, 1990), modifying adolescents' aggressive behavior (Huey, 1988), improving individuals' social skills and emotional health (Eskin, 2003). According to Morganett (1990) the group-based intervention programs are beneficial especially for adolescents. This study shows that assertive training encompassing 5 sessions has an added value effect on effective increase of assertive knowledge and behaviour among adolescents which helps to enhance their resilience for better adaptation in the University.

Hypothesis 3 was used to ascertain the significant difference effects in resilience enhancement among adolescents at-risk behaviour in the two independent variables, SFBT and AT experimental groups and control group based on their pretest post-test scores on Resilience scale (RS). The result in table 6 shows that $F(2, 56)$

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= 126.376, p = 000. Between groups are presented in main effect (VAR00003) rows and while within groups presented in Error rows. In main effect rows, Type III Sum of Squares 31421.591, 2 degree of freedom, 15710.796 Mean Square , 126.376, 2 F ratio and p= .000 significance. The Error has type sum of square of 6961.805, degree of freedom of 56 and mean square of 124.318. The computed ANCOVA coefficient (F) is 8.536 and is statistically significant at possible chosen alpha level of .05 with its actual probability in the population is as low as .000. Therefore, with the effect of the Pre-test covaried out, adjusted for, removed or partialled out, the hypothesis of no significant difference in the effect of both SFBT and AT on resilience enhancement among adolescents at-risk behaviour based on their Pre-test, Post-test scores as stated in hypothesis 3, as this is rejected both at .05 and .01 levels of significance. There is statistically significant means difference among the experimental groups and control group because F (2, 56) =, $p < .05$. The observed significant difference in the mean scores of the participants in the treatment groups and those in the control group can be explained in terms of the composition of the treatment strategies which were properly organized and were systematically presented in both experimental groups but none in the control group. Therefore, the superiority of the treatment groups over the control group who had no treatment at all in the acquisition of desirable resilience made the difference. In addition, the finding reveals, that although SFBT and AT are effective in resilience enhancement but students seem to be more comfortable with SFBT and that may be why students responded more in the group.

In addition the results obtained in AT group of this study were consistent with the ones obtained in is the efficacy of Assertive Training studies of Ugwuegbulam (1997) and Okoro (cited in Nnodum, 2010) who effectively used AT to manage different behaviour problems in children and adolescents although the present study was on enhancing resilience The success achieved through the AT in improving the social skills of isolates of the study and consequently reduced their isolate behaviour tendencies confirms the study positive just as this study had a positive result.

Group one having gone through SFBT showed that SFBT is a competency-based, resiliency-oriented models and as such had some of the components of motivational enhancement interviewing (Miller & Rollnick, 2002). Some of the major active ingredients in SFBT include; developing a cooperative therapeutic alliance with the client; creating a solution versus problem focus; the setting of measurable changeable goals; focusing on the future through future-oriented questions and discussions; scaling the ongoing attainment of the goals to get the client's evaluation of the progress made; and focusing the conversation on exceptions to the client's problems, especially those exceptions related to what they want different, and encouraging them to do more of what they did to make the exceptions happen yielded positive results. Furthermore, the researchers in SFBT used more indirect methods such as the use of extensive questioning about previous solutions and exceptions. In SFBT, the client is the expert, and the researchers took a stance of not knowing and of leading from one step behind" through solution-focused questioning and responding. The overall attitude is positive, respectful, and hopeful. This eventually resulted in a general assumption that people are strongly resilient and continuously utilize this to make changes. This might be the reason SFBT yielded a better result than AT in resilience enhancement. Another reason might be that the best way to learn assertive behavior is through practice. But not everyone is ready to practice in real life. In SFBT the researchers frequently ended the session by suggesting a possible experiment for the client to try between sessions if they so choose. These experiments are based on something the client is already doing (exceptions), thinking, feeling, etc, that is heading them in the direction of their goal (Lutz and Bodmer, 2013).

CONCLUSION

From the findings of this study titled: Effects of Solution-focused brief therapy and assertiveness training on resilience enhancement among adolescents At-risk behaviour the researchers' then conclude that:

- There is a significant effect of the two independent variables, SFBT and AT on resilience enhancement among adolescents At-risk behaviour although SFBT group achieved better results.
- The control group had no significant different on their resilience enhancement as they received no treatment.

From the results of the findings of the study both SFBT and AT are effective psychotherapeutic interventions that can enhance resilience among adolescents At-risk behaviour although SFBT has proved to be more effective in this case. Also, the study provides the fact that the ability to recognise and support the adaptation and well-being issues faced by students is potentially an important task which the University counsellors can effectively handle.

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RECOMMENDATIONS

1. For young people with limited life experience, guidance and counselling are needed to enhance the understanding of themselves, other people, and their responsibilities in the world. Therefore, counsellors should include resilience enhancement program as part of orientation processes of new students for their proper adaptation in the university.

2. Rather than spending the vast majority of time and energy examining the negative consequences of at-risk behaviours, counsellors can learn to simultaneously evaluate and teach methods to enhance resilience. Such an approach moves the field away from a purely deficit-based model of intervention, toward the inclusion of strength and competence-based models that focus on prevention and building strengths in addition to addressing psychopathology.

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EMPOWER WOMEN THROUGH ENTREPRENEURSHIP (SPECIAL REFERENCE TO BEED TALUQA)

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ABSTRACT
The present study aims to find the overall impact of entrepreneurship development on women's status and the extent to which an entrepreneur is empowered. The study was conducted in Beed Taluqa in Marathwada. A total of 16 women entrepreneurs were randomly selected for the purpose. A survey schedule was developed for the collection of data, based on pre-testing. The data was analyzed statistically for frequency, percentage. The findings revealed that there is a substantial improvement in overall status of women in the family and Society.

Keywords:Women Entrepreneur, women-empowerment, entrepreneurship, Status.

INTRODUCTION
Women from an important segment of the labor force and the economic role-played by them cannot be isolated from the frame work of development. The role of women as business owners is gradually increasing all over the world. Women entrepreneurship development is the instrument of women empowerment. Empowerment leads to self-fulfillment and women become aware of where they are going, what their position is in the society, their status existence and rights and women are becoming more empowered, personally and economically through business ownership.

"A small-scale industrial unit/industry repeated service or business enterprise managed by one or more women entrepreneurs in proprietary concerns, or in which she/they individually or jointly have a share capital or not less than 51 percent as partners/ share holders/directors of private limited company member of a co-operative society, is defined as a women enterprise."

Women are regarded as better half of the society. In traditional Indian societies, they were confined to four walls. In modern society, they come out of four walls to participate in all types of activities including entrepreneurship. In India empowering women through entrepreneurship has become an integral part of our development efforts. According to previous studies women entrepreneurship is an important tool for empowering women. The word empowers means to bestow power. Empowerment of Women through entrepreneurship involves access to resources and markets, actual ownership and active control, these may be the three important factors for the empowering women. In the process of empowerment, women should consider their strength, weakness, opportunities and threats and move forward to unfold their own potential to achieve their goals through self development. In our country with such a huge population and problems of unemployment, women entrepreneurship happens to be one of the best tool for women empowerment. The women entrepreneurs need not to be highly educated. It is sufficient that they possess basic knowledge of language and entrepreneurial skills. As women have to fulfill dual roles, entrepreneurship is a more suitable profession than regular employment either in public or private sector. Women entrepreneurship is the process where women take, lead and organize a business or industry and provide employment opportunities to other. Women are venturing in all kind of enterprises. Women entrepreneurs are considered to be most important economic agents for economic augmentation of the country. They are the owners, producers, coordinators, sellers, decision makers, risk takers, innovators etc. They also generate employment opportunities and contribute in improving family's living standard. Today's women must supplement the family income using their potential and skills that they possess. Her skills and competencies may be sharpened and turned by way of training. They can successfully start their enterprise and earn their livelihood.

RESEARCH METHODOLOGY
Small Business enterprise help women in income generation and make them economically independent. Women also add to family's income and improve living standard of their family. The number of women entrepreneurs in this sector is increasing day by day. Present study is based on primary data. Personal interviews of 16 women entrepreneurs from Beed Taluqa who are running various Micro ventures was conducted to know about their socio-economic profile. Respondents were randomly selected. The data was collected, statistically analyzed and presented here.

A. Objective of The Study
Present study was conducted about women entrepreneurs in Beed Taluqa.

To study socio-economic profile of selected women entrepreneurs.

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B. Importance of The study

Now a days' women entrepreneurship become an important tool for women empowerment. Women entrepreneurs also enhance living standard of their family which in turn help in development of the country. Entrepreneurs are regarded as backbone of any economy.

Thus these Enterprises are proved to be an important tool for women empowerment.

DATA ANALYSIS & DISCUSSION

Data collected about age, caste, marital status, education & training, family type, financial support, Social and Family Status.

Age

Age refers to the chronological age of the respondents in the years at time of interview.

Table-1: Age
(N=16)

	Age Group					
Marital status	**15-25**	**26-30**	**31-35**	**36-40**	**Above 40**	**Total**
Unmarried	00	03	02	00	00	**05**
Married	01	01	03	04	02	**11**
Total	**01**	**04**	**05**	**04**	**02**	**16**

Source: Socio-economic survey (2014-15)

It is evident from the fig.1, that the majority of respondents 05 were in age group of 31-35 while equal no. of respondents i.e. 4 belong to age group 26-30 and 36-40while only 3 respondents fall in category of Above 40.We can see that maximum no. of respondents belong to middle age group.

More no. of respondents (11) were found to be married out of total no. of respondents. 05 respondent are Unmarried.

Caste

Caste is permanent stratification of the society. It is a social category whose members are assigned a permanent status within a given social hierarchy.

Table-2: Caste
(N=16)

Sr. No.	Caste	Entrepreneurs
1	Maratha	06
2	Vanjari	04
3	Muslim	02
4	Mali	01
5	Jain	03
Total		**16**

Source: Socio-economic survey (2014-15)

It is evident from the fig.2 that the maximum no. of respondents belong to Maratha i.e. 06. This may be because they are traders in social stratification. Then followed by Vanjari 04 and Jain 03, respondents while Muslim and Mali each having 2-1

Education and Training

Education refers to the level of formal education obtained by the respondent while training is for skill development for the enterprise.

Table-3: Education & Training
(N=16)

Sr. No.	Education	Entrepreneurs	Training, Course	
			Yes	No
1	Primary	02	00	02
2	SSC & HSC	12	04	08
3	Graduation	02	00	02
Total		**16**	**16**	

Source: Socio-economic survey (2014-15)

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It is evident from fig. 3 that 12 respondents are SSC & HSC. Each 02 respondents are Primary Education, Graduate. Only 04 respondents are trained. 12 respondents are untrained entrepreneurs.

Financial Support

Financial support is defined as financial assistance which entrepreneurs take while starting their venture. This may be: ***(a)*** *Own funds, and* ***(b)*** *Loan funds.* Own Funds i.e. their own saving or family's saving while loan funds they take from banks or some funding agencies. Entrepreneur has to pay some interest when she returns loan.

Table-4: Financial Support
(N=16)

Sr. No.	Financial Support	Entrepreneurs
1	Own funds	03
2	Family Funds	01
3	Loan funds	12
	Total	**16**

Source: Socio-economic survey (2014-15)

Fig.4 depicts that 12 respondents take financial support from banks. 1 respondents of take support from Family. 3 respondents have their own finance.

Social Status & Family Status Improvement

To know after starting own business respondents social and family status are respectable improve.

Table-5: About Social Status & Family Status Improvement
(N=16)

Sr. No.	Status	Entrepreneurs
1	Yes /Social Status are improve	15
2	No/ Social Status are not improve	01
	Total	**16**
3	Yes in the Family Status are improve	16
4	No in the Family Status are not improve	00
Total		**16**

Source: Socio-economic survey (2014-15)

It is evident from the fig.5 that the after starting own business maximum respondents (15) social status were improve. All respondents Family Status are also improve. After starting venture people from society and their family members are respect them.

FINDINGS& SUGGESTIONS

There is no boundation of caste or marital or age on these entrepreneurs. More respondent are untrained. After starting own business respondents social and family status are improve.

The suggestions after doing this analysis were, as follows:

1) Women can be motivated towards enterprise by providing financial support lie loan on low interest.
2) Training programme at minimum or no fees charged, organized by government.
3) Seminars and conferences for these entrepreneurs can be organized for literate group.

CONCLUSION

From above discussion it is clear that women entrepreneurs are having good scope to develop. They can earn good amount after doing diploma or training courses. In starting they can invest small amount and letter they can invest more from their profit. As their experience increases with age their investment increases which in turn increases rate of return on investment.

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A NOTE ON RING BIMATRICES

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ABSTRACT
The concept of Ring bimatrices are introduced. Some of properties and characterization on Ring bimatrices are given.

Keywords: Bimatrix, Ring bimatrix, Ideal bimatrix, Homomorphism,

Ams Classifications: 15B05, 15A09

I. INTRODUCTION

Matrices provide a very powerful tool for dealing with linear models. Bimatrices are an advanced tool which can handle over one linear models at a time[5]. Bimatrices will be useful when time bound comparisons are needed in the analysis of the model[4].Unlike bimatrices can be of several types. Let *R* be a ring and let *Rn* be the complete ring *of n xn* matrices withcoefficients from *R[3]. If A* is any subset of *R*, we denote by *An* the subset of *Rn* consisting of the matrices of *Rn* with coefficients from *A.* If *R* is a ring with a unit element, the ideals of *Rn* are the sets *An* corresponding to the ideals *A* of *R[2].* But if *R* has no unit element, this is not, in general, the main case of the ring matrix combined to the bimatrix[1].

II. SOME OF DEFINITIONS AND THEOREMS

Bimatrices

A bimatrix A_B is defined as the union of two rectangular or square array of numbers A_1 and A_2 arranged into rows and columns.

$A_B = A_1 \cup A_2$ where $A_1 \neq A_2$

'U' is just the notational convenience (symbol) only.

$$A_1 = \begin{bmatrix} a_{11}^1 & a_{12}^1 & . & . & . & a_{2n}^1 \\ a_{21}^1 & a_{22}^1 & . & . & . & a_{2n}^1 \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ a_{m1}^1 & a_{m2}^1 & . & . & . & a_{mn}^1 \end{bmatrix} \text{ and } A_2 = \begin{bmatrix} a_{11}^2 & a_{12}^2 & . & . & . & a_{2n}^2 \\ a_{21}^2 & a_{22}^2 & . & . & . & a_{2n}^2 \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ a_{m1}^2 & a_{m2}^2 & . & . & . & a_{mn}^2 \end{bmatrix}$$

Square matrix

Let $A_B = A_1 \cup A_2$ be a bimatrix. If both A_1 and A_2 are square matrices then A_B is called square bimatrix.

Mixed bimatrix

If one of the matrices in the bimatrix $A_B = A_1 \cup A_2$ is square and other is rectangular or if both A_1 and A_2 are rectangular matrices say $m_1 x m_2$ with $m_1 \neq m_2$ or $n_1 \neq n_2$ then we say A_B is a mixed bimatrix.

Ring matrix

A matrix ring is any collection of matrices over some ring R that form a ring under matrix addition and multiplication. The set of nxn matrices with entries from R is a matrix ring denoted $M_n(R)$,as well as some subsets of infinite matrices which form infinite matrix rings.

Example 1

$$A = \begin{bmatrix} 1 & 4 \\ 2 & 0 \end{bmatrix}, B = \begin{bmatrix} 5 & 2 \\ 3 & 3 \end{bmatrix}$$

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$$A+B=\begin{bmatrix}1 & 4\\ 2 & 0\end{bmatrix}+\begin{bmatrix}5 & 2\\ 3 & 3\end{bmatrix}$$

$$=\begin{bmatrix}6 & 6\\ 5 & 3\end{bmatrix}\in R$$

$$\text{AB}=\begin{bmatrix}1 & 4\\ 2 & 0\end{bmatrix}\begin{bmatrix}5 & 2\\ 3 & 3\end{bmatrix}$$

$$=\begin{bmatrix}17 & 14\\ 10 & 4\end{bmatrix}\in R$$

The 2x2 matrix satisfies the commutative and distributive property.

$\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$ is the zero element.

$\begin{bmatrix}-1 & -4\\ -2 & 0\end{bmatrix}$ is the inverse of $\begin{bmatrix}1 & 4\\ 2 & 0\end{bmatrix}$

$\therefore R$ is a ring.

Hence proved.

Ring bimatrix homomorphism

If ϕ is a homomorphism the ring bimatrix (R_B,+,.), $\phi : R_B \to R_B^{'}$

$(i)\ \phi\left(A_B + B_B\right) = \phi(A_B) + \phi(B_B)$

$(ii)\ \phi\left(A_B B_B\right) = \phi(A_B)\phi(B_B) \forall A_B, B_B \in R_B$

$A_B = A_1 \cup A_2$

$B_B = B_1 \cup B_2$

III. SOME OF THEOREMS

Theorem 1

If R_B is a ring bimatrix with unit element 1&ϕ is homomorphism of $R_B \to R_B^{'}$. Prove that ϕ(1) is element of $R_B^{'}$.

Proof

Since ϕ is homomorphism of $R_B \to R_B^{'}$.

$R_B^{'}$ is the homomorphic image of R_B.

If 1 is the unit element of R then $\phi(1) \in R_B^{'}$.

Let $A_B^{'} \in R^{'}$

Then $A_B^{'} = \phi(A_B) \forall A_B \in R_B$

Now, $\phi(1)(A_B^{'}) = \phi(1)\phi(A_B)$

$$=\phi(1)\phi(A_1 \cup A_2)$$
$$=\phi[1.(A_1 \cup A_2)]$$
$$=\phi\left(A_1 \cup A_2\right)$$
$$=A_B^{'}$$

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and,

$$(A^{'}_{B})\phi(1) = \phi(A_B)\phi(1)$$
$$= \phi(A_1 \cup A_2)\phi(1)$$
$$= \phi[(A_1 \cup A_2).1]$$
$$= \phi(A_1 \cup A_2)$$
$$= A^{'}_{B}$$

$\therefore \phi(1)$ is unit element of $R^{'}_{B}$.

Ideal bimatrix

A non-empty subset $U_B(R_B)$ is said to be a Ideal bimatrix of R_B.

(i) U is a subgroup of R_B under addition.

(ii) For every $u \in U_B$ and $r \in R_B$ both ur and ru in U_B.

Theorem 2

If U_B is an ideal of ring bimatrix 'R_B' then R_B/U_B is a ring bimatrix is a homomorphic image of R_B.

Proof

Let U_B be an ideal of R_B and let R_B/U_B be set of all distinct coset of 'U' in 'R'. By theory of group R_B/U_B is Quotient group, where addition is defined by

$$A_B + U_B, B_B + U_B \in R_B / U_B$$
$$\Rightarrow (A_B + U_B) + (B_B + U_B)$$
$$\Rightarrow (A_B + B_B) + U_B$$
$$\Rightarrow \left[(A_1 \cup A_2) + (B_1 \cup B_2)\right] + (U_1 \cup U_2)$$
$$\Rightarrow \left[(A_1 + B_1) \cup (A_2 + B_2)\right] + U_B$$

We shall pove that multiplication is well defined.

$$(A_B + U_B) = \left(A_B{}' + U_B\right)$$
$$(B_B + U_B) = \left(B_B{}' + U_B\right)$$

$$\therefore A_B \in A_B{}' + U_B \Rightarrow A_B{}' + u_1$$
$$B_B \in B_B{}' + U_B \Rightarrow B_B{}' + u_2$$
$$(A_B B_B) = \left(A_B{}' + u_1\right)\left(B_B{}' + u_2\right)$$

$$= A_B{}' B_B{}' + A_B{}' u_2 + B_B{}' u_1 + u_1 u_2$$
$$= A_B{}' B_B{}' + U_B$$
$$= \left[(A_1 \cup A_2)' (B_1 \cup B_2)'\right] + U_B$$
$$(A_B B_B) = \left[\left(A_1' B_1'\right) \cup \left(A_2' B_2'\right)\right] + U_B$$

We shall prove that R_B / U_B is Ring, we shall see that R_B / U_B is closed under multiplication and associative law is hold.

Now,

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$A_B + U_B, B_B + U_B, C_B + U_B \in R_B / U_{B.}$

$$(A_B + U_B)\left[(B_B + U_B) + (C_B + U_B)\right]$$
$$= (A_B + U_B)\left[B_B + C_B + U_B\right]$$
$$= A_B (B_B + C_B) + U_B$$
$$= A_B B_B + A_B C_B + U_B$$
$$= A_B B_B + U_B + A_B C_B + U_B$$
$$= (A_B + U_B)(B_B + U_B) + (A_B + U_B)(C_B + U_B)$$
$$= \left[(A_1 \cup A_2)(B_1 \cup B_2)\right] + U_B + \left[(A_1 \cup A_2)(C_1 \cup C_2)\right] + U_B$$
$$= \left[(A_1 B_1) \cup (A_2 B_2)\right] + U_B + \left[(A_1 C_1) \cup (A_2 C_2)\right] + U_B$$
$$= \left[(A_1 \cup A_2) + U_B\right]\left[(B_1 \cup B_2) + U_B\right] + \left[(A_1 \cup A_2) + U_B\right]\left[(C_1 \cup C_2) + U_B\right]$$

Similarly we can prove that distributive law.

Hence $R_B / U_{B.}$ is a ring.

We claim that,

$R_B / U_{B.}$ is homomorphic image of R_B.

$\phi: R_B \to R_B / U_{B.}$.

$\therefore \phi(A_B) = A_B + U_B$

$$\phi(A_B + B_B) = A_B + B_B + U_B$$
$$= (A_B + U_B) + (B_B + U_B)$$
$$= \phi(A_B) + \phi(B_B)$$
$$= \phi(A_1 \cup A_2) + \phi(B_1 \cup B_2)$$
$$= \phi(A_1 + B_1) \cup \phi(A_2 + B_2)$$

Now,

$$\phi(A_B B_B) = A_B B_B + U_B$$
$$= (A_B + U_B)(B_B + U_B)$$
$$= \phi(A_B)\phi(B_B)$$
$$= \phi(A_1 \cup A_2)\phi(B_1 \cup B_2)$$
$$= \phi(A_1 B_1) \cup \phi(A_2 B_2)$$

$\therefore \phi$ is homomorphism with 1-1.

Let $X_B \in R_B / U_{B.}$.

$X_B = A_B + U_B \forall A_B \in R_B$.

$X_B = \phi(A_B B_B)$

$\therefore \phi$ is onto.

Hence $R_B / U_{B.}$ is a homomorphic image of R_B.

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Example 2

(*i*) $\phi(0)=0$, (ii) $\phi(-A_B)=-\phi(A_B)$

Solution:

(i) For every $X_B \in R$

$$\phi(X_B)=\phi(X_B+0)$$
$$=\phi(X_B)+\phi(0)$$
$$\phi(X_B)-\phi(X_B)=\phi(0)$$
$$\phi(0)=0$$

(ii) For every $\phi(0)=\phi\left[A_B+(-A_B)\right]$

$$=\phi(A_B)+\phi(-A_B)$$
$$0=\phi(A_B)+\phi(-A_B)$$
$$-\phi(A_B)=\phi(-A_B)$$
$$\phi(-A_B)=-\phi(A_B)$$
$$\phi\left[-(A_1\cup A_2)\right]=-\phi\left[(A_1\cup A_2)\right]$$

Theorem 3

If R_B is a Ring with unit element 1 is ϕ i.e., ϕ is homomorphism R_B into an integral domain R_B such that $I(\phi)=R_B$. Prove that $\phi(1)$ is the unit element of R_B'.

Proof

If ϕ is a homomorphism of a ring bimatrix R_B into an integral domain R_B'.

Then,

$$\ker nel \text{ of } I(\phi)=\left\{X_B : X_B \in R_B ; \phi(X_B)=0 \in R_B'\right\}$$

Q $I(\phi)\neq R$ such that $A_B \in R_B$

$\phi(A_B)\neq 0 \in R_B'$

we've $\phi(1)\phi(A_B)=\phi(1.A_B)$

$$=\phi(A_B)$$
$$=\phi(A_1\cup A_2)$$

Let $B_B' \in R'$

$$\phi(A_B)B_B'=\phi(A_B)B_B'$$

$\phi(1)\ \phi(A_B)B_B'=\phi(A_B)B_B'$

$\phi(A_B)\phi(1)B_B'-\phi(A_B)B_B'=0$

$\phi(A_B)\left[\phi(1)B_B'-B_B'\right]=0$

$\phi(A_B)\neq 0$

$\therefore \phi(1)B_B'-B_B'=0$

$\Rightarrow \phi(1)B_B'=B_B'\phi(1)$

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$\phi(1)\mathrm{B}_B{}' = \mathrm{B}_B{}' = \phi(1)\ \forall \mathrm{B}_B{}' \in R_B$

$\therefore \phi(1)$ is the unit element of $R_B{}'$.

Ring homomorphism of bimatrix

A ring homomorphism is a function between two rings which respects the structure.

R_B and S_B are rings, then a ring homomorphism is a function.

$$f : R_B \to S_B$$

$$f(a+b) = f(a) + f(b)\ \forall\ a,b \in R_B$$

$$f(ab) = f(a)\,f(b) \forall\ a,b \in R_B$$

If R_B and S_B are rings (Pseudo rings or non-unital rings)

$$f(A_B + B_B) = f(A_B) + f(B_B)\ \forall\ A_B, B_B \in R_B$$

$$f(A_B B_B) = f(A_B)\,f(B_B)\ \forall\ A_B, B_B \in R_B$$

$$A_B = A_1 \cup \mathrm{A}_2$$

$$\mathrm{B}_B = \mathrm{B}_1 \cup B_2$$

Theorem 4

$$B_B A_B = (B_1 A_1) \cup (B_2 A_2)$$

$$= \left\{ \begin{bmatrix} 2 & 4 & 1 \\ -3 & 1 & 2 \\ 0 & 5 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 3 \\ 2 & -1 & 1 \\ 1 & 1 & 0 \end{bmatrix} \right\} \cup \left\{ \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix} \right\}$$

$$= \begin{bmatrix} 11 & -3 & 10 \\ 1 & 1 & -8 \\ 11 & -4 & 5 \end{bmatrix} \cup \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$$

(Distributive law)

$$A_B(B_B + C_B) = A_B B_B + A_B C_B$$

$$A_B = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} \cup \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$$

$$B_B = \begin{bmatrix} 3 & 1 & 2 \\ 1 & -1 & 4 \\ 0 & 1 & 0 \end{bmatrix} \cup \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$$

$$C_B = \begin{bmatrix} 3 & 4 & 2 \\ -1 & 0 & 1 \\ 1 & 6 & 1 \end{bmatrix} \cup \begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix}; A_B, B_B, C_B \in R_B$$

$$A_B(B_B + C_B) = (A_1 \cup A_2)\left[(B_1 \cup B_2) + (C_1 \cup C_2)\right]$$

$$= (A_1 \cup A_2)\left[(B_1 + C_1) \cup (B_2 + C_2)\right]$$

$$= \left[A_1(B_1 + C_1)\right] \cup \left[A_2(B_2 + C_2)\right]$$

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$$= \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} \left\{ \begin{bmatrix} 3 & 1 & 2 \\ 1 & -1 & 4 \\ 0 & 1 & 0 \end{bmatrix} + \begin{bmatrix} 3 & 4 & 2 \\ -1 & 0 & 1 \\ 1 & 6 & 1 \end{bmatrix} \right\} \cup \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix} \left\{ \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} + \begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix} \right\}$$

$$= \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} \begin{bmatrix} 6 & 5 & 4 \\ 0 & -1 & 5 \\ 1 & 7 & 1 \end{bmatrix} \cup \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix} \begin{bmatrix} 4 & 1 \\ 3 & 3 \end{bmatrix}$$

$$A_B(B_B + C_B) = \begin{bmatrix} 7 & 12 & 5 \\ 0 & -2 & 10 \\ 17 & 4 & 31 \end{bmatrix} \cup \begin{bmatrix} 11 & 5 \\ -4 & -1 \end{bmatrix}$$

$$A_B B_B + A_B C_B = (A_1 \cup A_2)(B_1 \cup B_2) + (A_1 \cup A_2)(C_1 \cup C_2)$$
$$= [(A_1 B_1) \cup (A_2 B_2)] + [(A_1 C_1) \cup (A_2 C_2)]$$
$$= \{[A_1 (B_1 + C_1)] \cup [A_2 (B_2 + C_2)]\}$$

$\therefore A_B(B_B + C_B) = A_B B_B + A_B C_B$.

It satisfies the distributive property.

$$A_B + (B_B + C_B) = (A_B + B_B) + C_B$$

$$A_B + (B_B + C_B) = (A_1 \cup A_2)[(B_1 \cup B_2) + (C_1 \cup C_2)]$$
$$= (A_1 + B_1 + C_1) \cup (A_2 + B_2 + C_2)$$
$$= \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} + \begin{bmatrix} 3 & 1 & 2 \\ 1 & -1 & 4 \\ 0 & 1 & 0 \end{bmatrix} + \begin{bmatrix} 3 & 4 & 2 \\ -1 & 0 & 1 \\ 1 & 6 & 1 \end{bmatrix}$$
$$\cup \left\{ \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} + \begin{bmatrix} 3 & 1 \\ 2 & 2 \end{bmatrix} \right\}$$
$$= \begin{bmatrix} 7 & 5 & 5 \\ 0 & 1 & 5 \\ 4 & 11 & 0 \end{bmatrix} \cup \begin{bmatrix} 6 & 2 \\ 2 & 3 \end{bmatrix}$$

Similarly,

$$(A_B + B_B) + C_B = \begin{bmatrix} 7 & 5 & 5 \\ 0 & 1 & 5 \\ 4 & 11 & 0 \end{bmatrix} \cup \begin{bmatrix} 6 & 2 \\ 2 & 3 \end{bmatrix}$$

$\therefore A_B + (B_B + C_B) = (A_B + B_B) + C_B$

$$A_B(B_B C_B) = (A_B B_B) C_B$$

$$A_B(B_B C_B) = (A_1 \cup A_2)[(B_1 \cup B_2)(C_1 \cup C_2)]$$
$$= (A_1 \cup A_2)[(B_1 C_1) \cup (B_2 C_2)]$$
$$= [A_1 (B_1 C_1)] \cup [A_2 (B_2 C_2)]$$

$$= \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} \left(\begin{bmatrix} 3 & 1 & 2 \\ 1 & -1 & 4 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 3 & 4 & 2 \\ -1 & 0 & 1 \\ 1 & 6 & 1 \end{bmatrix} \right)$$
$$\cup \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix} \left(\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 3 & 1 \\ 2 & 2 \end{bmatrix} \right)$$

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$$= \left\{ \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 3 & 4 & -1 \end{bmatrix} \begin{bmatrix} 10 & 24 & 9 \\ 8 & 28 & 5 \\ -1 & 0 & 1 \end{bmatrix} \right\} \cup \left\{ \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix} \begin{bmatrix} 3 & 1 \\ 5 & 3 \end{bmatrix} \right\}$$

$$A_B(B_B C_B) = \begin{bmatrix} 9 & 24 & 10 \\ 16 & 56 & 10 \\ 63 & 184 & 46 \end{bmatrix} \cup \begin{bmatrix} 11 & 5 \\ -3 & -1 \end{bmatrix}$$

Similarly,

$$(A_B B_B) C_B = \begin{bmatrix} 9 & 24 & 10 \\ 16 & 56 & 10 \\ 63 & 184 & 46 \end{bmatrix} \cup \begin{bmatrix} 11 & 5 \\ -3 & -1 \end{bmatrix}$$

$\therefore A_B(B_B C_B) = (A_B B_B) C_B$

$\therefore$ It satisfies the associative property.

$\therefore \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is the zero element.

$\therefore R_B$ is a Ring with mixed square bimatrix.

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INNOVATIVE TEACHING TECHNIQUES FOR IMPROVING QUALITY OF LEARNING AT PRIMARY LEVEL

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ABSTRACT
Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of student learning that occurs. A teacher tries his best to impart knowledge as the way he understood it. So, any communication methods that serve this purpose without destroying the objective could be considered as innovative methods of teaching. Using innovative techniques of teaching in classroom instruction not only make the classroom lively but also Teachers use different teaching methods depending on the nature of subject, number of students, and the facilities available in the classroom. In primary classroom, Rote drill, Group discussion, Brainstorming, Individual presentation, Role-play and Activities are various common techniques of teaching. In this paper the authors have suggested few teaching techniques that can be used in primary classroom teaching to improve the present teaching learning process.

Keywords: Teaching Techniques, Primary classroom, India

INTRODUCTION
Education, like almost every other area of our society, has evolved in leaps and bounds in recent years. Traditionally, Indian classroom focus was on teaching and not on learning. Classrooms were teacher centric, learning driven by listening and emphasis was on rote learning. Teaching materials or learning aids were lacking.

Traditional teaching techniques which were based mainly on a teacher explaining a topic and students *taking notes*, may still be useful on occasion, but today to awaken the curiosity and desire of student to learn comes first. The biggest challenge for any teacher is capturing each student's attention and conveying ideas effectively enough to create a lasting impression.

Innovative teaching is the process of leading to creative learning, by implementing new methods, tools and contents that can benefit learners and their creative potentials. Instead of passively 'absorbing' the knowledge, students should be actively involved in the learning processes, participate and collaborate. Innovative teaching is a necessity for all teachers to meet the educational needs of the new generations. If students cannot understand and remember through the way they teach (method A), it must be given up for an innovative teaching method B. However, teachers' competency for innovative teaching is a key factor influencing innovative teaching performance.

Some research points out that many teachers lack competencies for innovative teaching. A good teacher should be committed to using a variety of methods and tools to ensure that each student is fully engaged in learning and interaction is made in classrooms. For a primary school teacher, it's critical for a teacher to adopt a teaching style that will work best for the students as no two students learn the same way. So, to be the most effective teacher, it's important to know each of students' strengths and weakness—and then consider combining teaching styles.

Every child learns differently—some prefer looking at photos, others like to listen, and some like to move around. That's why it's important to understand different learning and teaching styles to benefit *all* students. Visual learners will remember information best when presented with pictures or graphics. Auditory learners are best able to understand when they hear information. In early education, auditory learners are more likely to prefer listening to stories or telling stories to understand information. Students with a kinesthetic learning style learn best by manipulating objects and engaging in physical activities to learn the material.

As children continue to learn reading, writing, logic, and socializing skills, they may adapt to different learning styles. Verbal learners prefer learning through reading, writing, and listening to information. Auditory learners focus on music and sound but will not necessarily enjoy reading or writing. Logical or mathematical learners understand math and science better than other students and use reasoning to provide answers. Some students learn better in group settings while others are solitary learners.

It is found that children do not learn by listening alone. They also learn by doing, experiencing and reflecting. Numbers, for instance, were taught as rhymes or through activities and games. The core philosophy was to help students act and think independently, avoid rote learning and solve problems creatively. The children loved these methods and were quick to learn. They began to excel in the formal schools as well.

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INDIAN SCENARIO

Between 2000 and 2015, India increased its net enrolment rate—a measure of the primary school age children enrolled in either primary or secondary school from 86% to 99%, thus achieving universal enrolment, according to 2015 United Nations Educational, Scientific and Cultural Organisation (UNESCO) report. However, poor learning outcomes overshadow these strides in primary school enrolment.

At least half of all Indian children aged 6 to 14—about 100 million—are at least two to three years behind their expected math and Hindi and English reading and comprehension skills,. Essentially, students are being promoted to the next grade without learning (Bahri, 2016).

The national education policy has stipulated that between classes I and IV, a student should acquire 554 competencies, including addition, subtraction, recognizing alphabets, forming words, and so on. These were used to draw up various activities. But several Surveys revealed that major per cent of primary school students in government and aided schools did not have a grasp of basic mathematical skills, could not read or write in their first language (India Spend, 2016).

A declining quality of learning has been reported over the last five years, despite spending Rs 1.2 lakh crore ($17.7 billion) on Sarva Shiksha Abhiyan. 52% of class 5 students cannot read a class 2 textbook in Hindi. Barely one in four class 5 children can read simple sentences in English or subtract double-digit numbers. In 2009, 11.3% of standard 2 students could not recognize numbers up to nine; five years later, the proportion of such students increased to 19.5%, as per the Annual Status of Education Report 2014 (ASER 2014) by Pratham (India Spend, 2016).

A closer look drives to main issues like access to quality primary education and the retention of students in schools which is highly correlated to the poor teaching standards. Teachers lack dedication and motivation to cater to diffrent student learning levels within a class, which makes it difficult for teachers to pay any attention to individual students. There is no better way to overcome this than by inculcating a culture of innovation.

Innovation is an idea practice perceived as new by the adopter. It is an attempt to reach the goal through a new route or to find new relationships even in familiar surroundings. Innovation may refer to any new idea, product approach an action plan. In any innovation, attempt is made to change the existing practice to suit the demands of the situation. Innovation blossoms when an individual puts his novels ideas in to action and realizes its uniqueness.

The application of innovative and interactive teaching technique in primary classroom has the potential not only to improve the quality of education, but also to empower students or future generation of the country by strengthening governance and galvanize the effort to achieve the human development goal for the country.

Innovative approaches practiced in few Indian schools, reveals how small, novel methods have redefined learning in the environment of their own little schools. Teachers in these schools may not have the desired resources or capital at their disposal but are constantly pushing the boundaries when it comes to improving learning outcomes through sheer creativity, enterprise and innovations.

Given below, a list of Innovative techniques of teaching is suggested that can be used by teachers in their own personal capacity, all with an aim to improve the primary grade learning levels with a classroom. some examples of interventions taken out in country have also been included to give a hint of the kind of platforms that exist to help teachers manage their workload and be more effective at teaching primary graders.

1. **Effective Teaching with VAK:** The teacher must identify each child's ability to process information so that they can achieve success at a faster rate. There are 3 main types of learners – Visual, Audio, and Kinesthetic. Visual is *seeing* the material, Audio is *hearing* the material, and Kinesthetic is *feeling* the material. The optimal learning environment is when the Student sees, hears, and feels the material themselves. That's why making animated videos and presentations have become such a popular new medium of effective teaching recently. Animated videos hit the Audio and Visual, and when the Student creates one of them, it hits the kinesthetic type too.
2. **Using Visual aids:** using word flashcards, use of dictionaries and thesauruses, picture dictionaries, charts and pictures, showing actual objects, models, globes, and maps. Even the extensive collection of coins and stamps also can be used to provide a qualitatively different educational experience to the children.
3. **Using Creative Tools:** Use of creative tools made by teachers or by students in a classroom instruction helps to stimulate creativity in the students. Visual exercises that captivate interest of students should be made a part of instructions. This can go long way in bringing out innate possibilities within students.

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4. **Using Audio & Video Tools:** Incorporating audio-visual materials to supplement textbooks act as a teaser to both logic & creativity in the students. Tools like smart phone apps, filmstrips, movies, pictures, info graphics or other will help their imagination thrive and grow. This not only develop their ability to listen but will also help them understand the concepts better.

   Many schools in India at primary level have AV-equipped classrooms or venues to boost students' learning and understanding. Subject teachers are leveraging AV facilities in interesting ways to trigger the class's curiosity through graphics, images, and puzzles, thereby driving them to think out-of-the-box. Above all, it satisfies a student's need to see, hear, and have a complete grasp of what they are learning.

5. **Using "Real-World" Examples:** Infusing real world experiences into classroom instructions makes teaching moments fresh and enriches classroom learning. Relating and demonstrating through real life situations, will make the material easy to understand and easy to learn. It will also draw interest of many students which is the key motivation.

6. **Learning New Words:** To make students learn new words, Anita (Class 2 teacher) Satya Bharti Government Upper Primary School, Haryana designed a process named as 'pitara', where she asks students to collect English words they commonly use, present it to the class with the correct spelling and meaning, and then the word goes into the pitara. At the end of the week, all the words are taken out of the pitara and students share new words they learnt during the week. In this context, Vivek Chauhan, Principal of Government Primary School, Jaswala, (Rajasthan) devised a technique of his own, using the ubiquitous attendance register. Instead of calling out a student by his name, he addresses him using a fruit's name in English. The student would answer the roll call by responding with the Hindi word for the fruit. Encouraged, Chauhan extended the technique to other things — names of vegetables, birds, animals, countries and their capitals, scientists and their discoveries, books and their authors, etc. These two examples show that if the teachers want they can use innovative teaching methods at a very low cost.

7. **Teaching alphabets with Cut-outs:** Many teachers in six Rajasthan districts—Ajmer, Bundi, Jalore, Pali, Rajasamand and Sirohi—let their students learn by pictures instead of words, puzzles that help them find words, alphabet cutouts they can put together and other uncommon learning aids that increases their curiosity to learn.

   Moreover, Lata Koranga (Class I teacher) of Aryan Public School, Seelampur noticed that even though her students could identify alphabets through pictures (C for cat, D for dog), they clearly had trouble identifying alphabets on their own. In order to familiarise them with letters, she made cutouts of all English alphabets and pasted them on the classroom door. "I would tell them in the morning what the alphabet was called. Then, I would stand at the door and let the child enter the classroom after he pronounced the letter correctly. Every time, a child walks in and out of the classroom, he is supposed to pronounce the alphabet. Looking at the same alphabet through the day, the child finally learns," she says. She replicates the practice with Hindi alphabets, numbers etc.

8. **Using Songs:** Students enjoy the lessons more when teach them through poems. Jyoti Bhardwaj (Class 9 teacher) in Sarvodaya Kanya Vidyalaya, Jaffrabad help her students, understand and remember the rules, by using poems to teach children basic grammar lessons in nouns, pronouns, adjectives and sentence formation.

   In a classroom in the government school about 25 students from standards 3, 4 and 5 standing in a circle, animatedly recited a story spoken by teacher their recitation gradually rising in decibels with every repetition.

9. **Bundling Wood to Teach Maths**: In early stages, the concepts are important. Laxman Ram (Class I teacher) in Government Upper Primary School, Bagundu village, (Rajasthan) noticed that even though students at his school knew how to count, they did not have any concept of numbers. Till, he started using wooden sticks and bundles to simplify basic mathematical concepts like addition, subtraction, multiplication and division to help students understand the fundamentals.

10. **Use of School Building as an aid:** Dinesh Prajapati (A teacher in Gujarat) used village walls to write slogans from the textbooks and his post-card writing experiment in which he used three different kinds of cards to develop different competencies, make for interesting reading.

11. **Use of Film and Photographs:** The showing of film and/or photographs help create vivid images in the minds of the learners. This can be followed by a discussion on messages conveyed and learner's reactions.

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12. **Demonstration:** A lot of teachers rely on demonstration through experiments or with matching visual aids to help their students comprehend material, as many individuals benefit from this style of teaching no matter how they learn.
13. **Hands-on activities:** Students generally learn best from hands-on activities. For instance, students will most likely have difficulty understanding the concept of multiplication if it is just explained to them. But if they begin experimenting with multiplication and practicing this type of problem, they will understand it better and recall how it works.
14. **Role-play technique:** Teaching through role play is a great way to make children step out of their comfort zone and develop their interpersonal skills. As much as it is loved by students, this technique facilitates their understanding and appreciation of the characters that they read about. From pre-schools to Senior Secondary level, schools are implementing this method as it's a great source to instill in children values and ideals as they play the roles of historical stalwarts or legendary characters. Through role play, students also get to learn about various aspects of stage performance – from acting to voice projection – and discover their acting talent. This technique also helps teachers explore creativity and critical thinking in students.
15. **Use of Mind Maps:** We learn and remember more effectively by using the full range of visual and sensory tools at our disposal. Pictures, music, color, even touch and smell play a part in our learning armory will help to recollect information for long time. Researches proved that any information explained with the help of graph charts make a high impact in the minds of the people and keeping this as the core aspect the teachers may try to picturize the concepts and show the same to the students to explain concepts in an innovative way. Mind maps are much quicker to make and much easier to remember and review because of their visual quality.
16. **Story telling technique/ Telling Stories, Song/Poem:** Allowing students to listen to or read poems and songs, identify their favorite lines, and interpret messages within it will help them to learn in a more creative manner. Storytelling is a great way to teach any subject which requires memorization or difficult visualization. Apart from ease of communication, this will help students in developing their own storytelling techniques.
17. **Gamification:** Learning through play or '*Gamification*' is a learning technique that can be very effective at any age to keep students motivated. Children may not require taking conscious effort when their lessons are introduced through games. Learning through Puzzles and games help children to think creatively and face challenges. If carefully designed and smoothly executed by teachers, teaching through games reinforces cognitive knowledge, especially of mathematical and scientific concepts, and vocabulary. Teachers are experimenting with various kinds and levels of word and mind games like quiz, puzzle-solving, Scrabble, Sudoku, etc. Games help to seamlessly incorporate subject knowledge with application, and are an answer to productive and smart learning.
18. **Teaching with Sense of Humor:** Using humor in teaching is a very effective tool for both the teacher and student. Humor strengthens the relationship between student and teacher, reduces stress, makes a course more interesting and if relevant to the subject, may even enhance recall of the material. Humor can relax people, reduce tension, and thereby create an atmosphere conducive for learning and communication. It is easy to create a humor in the primary classroom by reading books of jokes and to listen to professional comics.
19. **Mnemonics:** In language teaching, Mnemonics technique can be used by the teacher to develop word power. Here, teacher is not supposed to talk on a concept for a quite long time. But to make it clear to the students he can just go on saying mnemonics or its associated meaning in words. Here he goes on saying only words instead of sentence, and once they come to a basic understanding of the meaning of a concept then the teacher will explain in sentences.
20. **Stimulating Classroom Environment:** Children, especially young ones cannot be expected to sit all day and learn. A learning environment that positively impacts the children has a prime role in learning and development. A well-decorated, fun, and engaging classroom environment will help stimulate a student's mind and will help think and learn better. Posters & paintings can help transform a dull classroom to an exciting place. Such creative and stimulating environment will help them explore and will encourage them to learn about the subject.
21. **Going beyond the classroom:** Schools are embracing the trend of taking children outside the classroom to make children aware of the world and themselves, widen their perspective, and make them seek the truth.

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Children gain more knowledge when they see and experience history in museums than being taught the same in the class. Shantilal Patel- A teacher in Gujarat uses gardens to make his schools educational centers.

22. **Using Information and Communication Technology (ICT):** Sandip Gund, a primary school teacher from Pashtepada, Maharashtra, converted an ordinary Zilla Parishad school into an extraordinary learning space, a digital shala, where children are taught using solar-charged tablets and computers instead of schoolbooks and digital pen to work on their lessons. The students get to practice their lessons and play games on the tablets. With a donated computer for the school, he started using science, animation and other interesting ways of teaching the children. His digital learning project received an award from the state's Council of Educational Research and Training.
23. **Free Online Learning Tools:** A teacher can use free online learning tools e.g. Kahoot, BYJU'S to encourage engagement, participation and a sense of fun into the classroom. Teachers can create an interactive and dynamic classroom environment using online quizzes to test student's knowledge.

The Learning App BYJU'S app offers a complete and comprehensive learning program for Class 4 & 5 students across all syllabi — CBSE, ICSE, State Boards, IGCSE and more. The app through interesting features like interactive games, puzzles, reward system, personalized learning etc. develops all essential skills that are needed to help prepare students to do well at school and builds a solid foundation for a successful future education. Some of the key features of this application are Engaging Video Lessons developed by India's best teachers. All topics and math concepts are explained in the form of games, educational videos, interactive puzzles and activities.

CONCLUSION

At primary school level, a young mind can grasp the basic concepts easily through innovative teaching techniques employed by teachers. The teacher's innovative style of teaching accelerates the learning process of children. By now today a lot of techniques of primary teaching have come up and the various innovations and the creative endeavors of the teachers are making classrooms zones of great activity and intellectual rigor. The role of teacher now modified to help children develop many capabilities. The teacher realizes the potentials of every child; recognize the qualities and educate them in a way that he or she can achieve success in his or her life.

The researchers recommend that the teaching at primary level would be highly effective if the teacher start to use the recent technologies extensively or some modifications in the conventional mode of teaching. The use of technology as well as other innovative teaching techniques could be used in class-room on a temporary basis and on the basis of success, it could be implemented further.

The researchers believe that any method either using technology or modifying the existing conventional chalk-talk method are innovative if they ultimately serve the attainment of core objective of teaching that is passing on the information or knowledge to the minds of the young students.

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UNDERSTANDING NEWS MEDIA AGENDA ON HUMAN RIGHTS: THE CASE STUDY OF THE HINDU

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ABSTRACT
The news media play a key role in sensitizing people about human rights issues and influence shaping public opinion. As gatekeepers, negotiators and custodians of democracy, newspapers create awareness among the public about their rights and responsibilities. This study was conducted to assess news media's agenda on human rights issues. For the purpose, content analysis as well as framing technique has been used. In order to understand news media agenda, the Hindu newspaper as a case study was taken and systematic random sampling method was employed to choose the contents of newspapers between 01 January to 30 June 2017. The frame of presentation of news in newspapers is of vital importance as it directly affects people's way of thinking. To analyse the news relevant to human rights issues seven frames were proposed–media referential, pragmatic, prognostic, victim, oppressor, sensational and media trial. The findings reveal that there are so many incidents of human rights violations to which media give scant attention and they are not in the news agenda. Most of the time, the stories relevant to human rights were presented in negative frames.

Keywords: Human Rights, Content Analysis, Framing, News, The Hindu, Agenda Setting

INTRODUCTION
The Indian press is more than two centuries old. It has always been a highly political press. Its strengths have largely been shaped by its historical experience and, in particular, by its association with the freedom struggle as well as movements for social emancipation, reform, and amelioration. This rich history accounts for the seriousness, relevance, and public-spirited orientation of the press at its best. India is one of the few places on earth where newspapers still thrive as there is a huge appetite for news in its readers and what masquerades as news, for analysis, for comment, and of course for entertainment and also for that hybrid creature, 'infotainment.' In spite of the vastly uneven dispersion among region and states, between urban and rural India, between men and women, and among social classes, newspapers in India still enjoying their credibility among masses. All this has spawned tens of influential Indian language daily newspapers, many of them with large circulations and huge readership. This buoyancy and influence of Indian press is a sign of progressive tradition in comparison with the western print media. Pluralism in The Indian media can be said to reflect the vast regional, linguistic, socio-economic, and cultural heterogeneity of the subcontinent. A positive factor for print media is that over the past quarter-century, its social representativeness has broadened.

However, in recent years, Indian newspapers are facing increasing pressure from advertisers, marketing personnel, corporate managers, private aggrandizement, the ascendancy of a new kind of international finance capital based on the globalization of finance, the intellectual hegemony attained by the spineless ideas and policies imposed by globalised finance, and the plethora of institutions and instruments that serve this juggernaut, and even senior journalists to present and prioritize 'feel good' factors – rather than highlight the reality of mass deprivation and what to do about them. The people-oriented issues like rural distress, farmers' suicides, mass migrations, poverty and mass deprivation, basic livelihood issues, the impact of policies on these issues, the state of agriculture and the countryside are the issues of agenda-building in India's context these days, which remain massively under covered or uncovered in most of the Indian newspapers.

As the press influences the functioning of democracy, the present paper tries to explore and understand the agenda-setting role of the press. In other words, the news media can set the agenda of the public to address their grievances to the government. The priorities of the media strongly influence the priorities of the public. The media agenda leave indelible mark on the minds of the public and shape their opinion towards a democratically elected government and its policies for their uplift. In order to understand the agenda setting role of news media, one of the most prominent and reputed daily newspaper of the world, the Hindu has been taken as a case study. The first editorial of The Hindu declared, "the press does not only give expression to public opinion, but also modifies and moulds it." This newspaper has built an unrivalled reputation for reliability and truthful presentation of news. The Hindu was founded on the principles of fairness and justice.

LITERATURE REVIEW
Gies (2015) noted that 'keeping in view the age-old maxim that only bad news has sufficient news value to make the headlines, stories about human rights violations have long formed the staple diet of humanitarian news: The Holocaust, Vietnam, the Former Yugoslavia, Palestine, Iraq, Afghanistan, Syria – the list of

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atrocities is ever expanding. The news media and increasingly social media join forces in reporting, exposing and admonishing governments caught violating the human rights of their citizens. Many a state sponsored violence, war or conflict waged by colonial European countries against middle-east countries is neglected or goes unreported by mainstream media. More recently, it was the war on terror which offered plenty of scope to turn the spotlight on human rights violations perpetrated by Western countries. Words such as extraordinary rendition, Guantanamo, Abu Ghraib, waterboarding and collateral damage entered our vocabulary in the last 13 years. Countries which are usually very vocal about human rights and are quick to admonish other nations have regularly featured in the news with their own human rights failures, although the public response has been very muted and even indifferent at times. Now, the press in particular has proved a prominent stakeholder in the debate to cover human rights violations during state protected lawlessness, conflict and war'. The book throughout the contents indicates that the hostile media publicity exacerbated the situation and may have foreclosed people's minds to what the reporting had to present the news as it is to influence larger population. However, despite the ridicule and disrespect heaped on the reporting of media quarters – indeed, one could argue precisely because of the ridicule and disrespect – it has become something of a cultural phenomenon. Whitten-Woodring (2007) outlines the relationship between media freedom and government respect for human rights. Contrary to the common perception that democracies to have more free media than that of autocracies, the author found that some autocracies have more free media than some of the democracies. This mismatch between regime type and media system influences government behaviour is a puzzle worth exploring. One of the most widely criticized government behaviours is the violation of physical integrity rights. The question posed here is, how does media freedom affect government respect for these rights? The paper's findings show that the influence of media freedom on government respect for human rights is negative for the most autocratic regimes and positive for only few democratic regimes. Krumbein (2017) examined how US-related human rights issues are covered in the New York Times, and which factors influence the coverage. The study is based on the analysis of 155 articles between the years 1998 and 2013. It deals with two major domains of reporting of human rights issues occurring: within the US proper and in US actions internationally. Human rights narratives in the US are important factors explaining the selective nature of the newspaper's reporting. The paper reflects the official discourse of the US government in its coverage of human rights topics. It also plays the role of a "watchdog" and criticizes the US human rights situation in some areas. Voltmer et al. (2017) tried to identify cross-national variations in media reporting of conflicts. Their data strongly reflect specific country contexts (and contexts of broader regions from which they come from) to be a consistent factor that shapes the pattern of media coverage reflecting the close interdependence between media and politics. For example, the army is perceived as a relevant political institution in Egypt (and much of the Middle East) due to its dominant role in politics since independence from colonial rule but not in other countries; except to some extent in the context of the conflict around the Somali community in Kenya, which is associated with terrorism. Likewise, the significance of international causes of conflict in Serbia (and the former Yugoslavia) reflects the importance of international factors. Further investigations are needed to explore the multiple transformations of meaning in public discourses that can tilt interpretations of political events toward unexpected directions.

OBJECTIVES OF THE STUDY

The broader objective of the study is to understand the agenda of the Hindu newspaper on human rights. Further the authors formulated the following objectives for closer scrutiny:

- To understand the ideology invested in covering the issues related to human rights in the Hindu newspaper
- To measure the space allocated to different human rights issues in the newspaper under study
- To estimate the frequency of coverage of stories relevant to human rights
- The know how much importance given to news stories relevant to human rights issues
- To find out different news frames employed while presenting human rights issues
- To identify and evaluate the stories related different categories of human rights violations

RESEARCH DESIGN & METHODS

Agenda-setting is the masterpiece of public understanding and consciousness on certain issues presented by the news media. Two basis hypothesis are the elementary part of the most research on agenda-setting: first, the press and the media do not mirror authenticity and realism; they filter, mould and shape it; and second, media attentiveness and engrossment on a few issues and subjects leads the public to distinguish those issues as more dispensable or consequential than those of other issues. The present paper has tried to explore various aspects to understand news media agenda on human rights and payed considerable heed to understand the vast world of

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public affairs that lies beyond our personal experience. As content analysis is intrinsically an orderly and coherent mechanism and it is the most reliable way to enumerate and analyse the content of the print media, the present study employed this method to evaluate the newspaper content and understand its agenda on human rights. The systematic random sampling technique was employed in this study. The data extracted through systematic random sampling spans from 01 January to 30 June 2017. News items on human rights were selected in a way that were being published in every fourth day covering a period of six months. By which the researchers drew samples viz. 1, 5, 9, 13, 17, 22, 26, 30 issues of a newspaper in a month.

Unit of Analysis: Each and every published newspaper content that are being directly and indirectly relevant to human rights issues as identified below.

Prominence: The space allocated to a news story in a particular page either in the Front or inside or back page determines its importance.

Frequency: The number of stories relevant to human rights covered by the newspaper

Newspaper Items: Newspaper content that are being classified as News Stories, Editorials, Features/Articles, Letters to Editor, Photographs, Special Stories/Opinion Pieces. Further, human rights issues have been classified as below: *Abduction/Kidnapping/Abduction-cum-Murder, Atrocities against Farmers/Farmer's Suicide/Rights of Farmers , Atrocities against Minorities/Mob Lynching , Atrocities against Protester/Lathi charge by Police/Detainment or killing of Protester/Agitator, Bonded labour/Forced Labour/Slavery/Servitude, Child Abuse/Molestation/Infant Death, Child Labour/Juvenile Delinquency/Rights of Children, Child marriage/Forced Marriage, Discrimination and Violence against Dalits, Dowry Death, Extortion/Money Laundering/Black Money, Forceful Eviction of Families/Displacement due to natural catastrophe, riots or communal hatred , Harassment/Intimidation, Honour Killing, Human Trafficking with Special Focus on Children and Women, Illegal Human Organ Trade/Transplantation , Malnutrition of Children/Food Deprivation/Starvation/Homicide due to Food Poisoning/Contaminated water or illicit hooch-liquor , Manual Scavenging, Naxal-Maoist Menace/Violence by Militant/Terror Funding/Surrender of Naxalite-Militants/Arresting or Killing of Naxalite/Terrorist, Perpetrated Atrocities against Tribal, Perpetrated Murder/Attempt to Murder/Killing or Assassination, Perpetrated Sedition Charge, Punishment to Oppressor/Justice to Victim (Rape Case/Murder Case) /Punishment to Exploiter/Perpetrator/Extortionist/Kidnapper/Honour Killer/Eve Teaser/Criminal Conspirator, Rape/Gang Rape/Rape-cum-Murder/Rape of Minors, Religious Violence/ Communal Hatred/Hate Speech/Hate Crime, Rights of Disabled and Mental Health/Atrocities against Physically Challenged People, Rights of Migrant Workers/Atrocities against Migrants/Racism or Xenophobia, Rights of Older Persons/Ageing/Elderly People, Rights of Prisoners/Atrocities in Jail, Rights of Refugees/Atrocities against Refugees, Sexual Violence/Assault/Harassment against Women, State Sponsored Violence/Encounter by Police-Military/Police Atrocities-Custodial Death-Extrajudicial Execution/Killing of Military Men/Police men on duty, Threat to Life /Abet to Suicide/Suicide, Women's Health and Reproductive Rights.*

FRAMING ANALYSIS

Framing refers to the way in which issues are organized and understood in the public arena; that is, frames are the organizing ideas, words, images and themes that are used to describe and structure information about a public policy issue. To analyse the news content total seven frames were identified–Pragmatic, Prognostic, Victim, Oppressor, Sensational, Media Referential and Media Trial

ANALYSIS & DISCUSSION

Frequency of coverage and Space allocation to different Human Rights Issues

Table-1: Frequency of coverage and Space occupied by different newspaper content on Human Rights Issues

Newspaper Content	Frequency	Space allocated in cm^2
News	437	59864.33
Editorial	10	1706.44
Feature/Article	10	6335.25
Letter to Editor	23	1940.29
Photograph	34	5743.87
Special Stories/Opinion Pieces	12	6886.75

The newspaper has published 437 new stories and allocated a space of about 59864 $cm^{2.}$ The frequency of news stories and space allocated for human rights issues indicates the special interest paid by the newspaper on these issues. Ten editorials have been published with 1706.44 cm^2 of space. Under feature/Article category also, the

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newspaper under study published ten stories with a space of 6335.25 $cm^{2.}$ The letter to the editor has indispensable significance as this is the only way by which readers can contribute their views with the newspaper; giving prominence by the newspaper by publishing 23 letters with a space of 1940.29 cm^2. There is a general saying that a photograph speaks more than thousand words. Under this category, the photographs which were covered separately as well as along with the story items were simultaneously included for the purpose of this study. There were 34 photographs encompassing the space of 5743.87cm^2. 12 special stories and/or opinion pieces with the area of 6886.75 published during the said period by the Hindu. The frequency of coverage and space allocation to different categories of newspaper content in the table-1 reveal that the Hindu newspaper gives prime importance to the human rights issues in its agenda.

Categorizing Human Rights' Issues

Table- 2: Human Rights' issues and their coverage

Human Rights Issues	Front Page Frequency (Space in cm^2)	Inside Page Frequency (Space in cm^2)	Front & Inside Pages Frequency (Space in cm^2)
Abduction, kidnapping, etc.	1 (15.4)	6 (454.25)	7 (469.65)
Farmers' rights	6 (794.41)	28 (4456.97)	34 (5251.38)
Rights of minorities	2 (217.25)	7 (957)	9 (1174.25)
Atrocities against Protester	10 (1424.85)	40 (7901.71)	50 (9326.56)
Bonded labour & forced labour	-	2 (423.5)	2 (423.5)
Child abuse, molestation, etc.	-	6 (1025.78)	6 (1025.78)
Child labour, juvenile delinquency	-	10 (1230.26)	10 (1230.26)
Child marriage, forced marriage	-	5 (769.5)	5 (769.5)
Atrocities against dalits	2 (47.54)	10 (1623.67)	12 (1671.21)
Dowry death	-	-	
Extortion, money laundering	3 (460.71)	14 (1460.02)	17 (1920.73)
Displacement	-	5 (913.3)	5 (913.3)
Harassment, intimidation	2 (323.25)	32 (3876.01)	34 (4199.26)
Honour killing	-	2 (168)	2 (168)
Human trafficking	-	4 (611.4)	4 (611.4)
Human organ trade	-	-	-
Malnutrition of children	-	15 (1467.67)	15 (1467.67)
Manual scavenging	-	1 (28)	1 (28)
Naxal, militant, terrorist violence	3 (710.7)	35 (6063.45)	38 (6774.15)
Atrocities against tribals	1 (189.75)	12 (1226.97)	13 (1416.72)
Murder, attempt to murder, etc	7 (625.23)	29 (3620.21)	36 (4245.44)
Sedition	1 (58.75)	3 (1642)	4 (1700.75)
Punishment to Oppressor	9 (1196.79)	41 (4567.57)	50 (5764.36)
Rape	-	36 (2673.25)	36 (2673.25)
Religious violence	3 (500.35)	10 (1371.65)	13 (1872)
Rights of disabled persons	-	4 (565.7)	4 (565.7)
Rights of migrant workers	1 (34)	6 (1358.9)	7 (1392.9)
Rights of elderly people	-	3 (471)	3 (471)
Rights of prisoners	2 (577.5)	16 (2030.48)	18 (2607.98)
Rights of refugees	1 (25.62)	9 (1540.92)	10 (1566.54)
Sexual violence against women	1 (166.86)	12 (1333.3)	13 (1500.16)
State sponsored violence	8 (849.94)	15 (2722.5)	23 (3572.44)
Suicide	-	18 (1014.01)	18 (1014.01)
Women's reproductive rights	1 (196.42)	1 (295.2)	2 (491.62)
Total coverage	64 (8415.32)	437 (59864.15)	501 (68279.47)

Table-2 reveals that the newspaper covered highest number of stories (50 each) on atrocities against protesters and punishment to oppressors. However, it provided more space 9326.26 cm^2 for atrocities against protesters and less space (5764.36 cm^2) for punishment. This indicates more importance given to happenings than that of follow-up (generally stories related to punishment are follow-up stories). Further, the newspaper covered 10 stories with a space of 1482.85 cm^2 on the front page and the remaining 40 stories with 7901.71 cm^2 space

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covered on the inside pages on stories related to atrocities against protesters. Similarly, on punishment to oppressors 9 stories with 1196.79 cm^2 on the front page and 41 stories with 4567.57 cm^2 on the inside page appeared in the newspaper. News related to issues of violence (Naxal, militant, terrorist) occupied second slot in the order of importance given by the newspaper under study. A total of 38 stories, of which 3 stories with 710.7 cm^2 appeared on the front page and 35 stories with a space of 6063.45 cm^2 on the inside page. The third slot in the order of importance given to stories related to murder and attempt to murder. There were 36 stories with 4245.44 cm^2 of space provided to stories related to murder; of which 7 stories with 625.23 cm^2 of space on the front page and the remaining 29 stories with 3620.21 cm^2 appeared on the inside page. The fourth on the line of importance given to stories on rape. There were 36 stories with 2673.25 cm^2 of space allocated to this kind of stories. All of the stories related to rape relegated to inside pages. Not a single story on rape appeared on the front page of the newspaper.

The fifth on the line of importance given to stories related to farmer's rights and harassment & intimidation. 34 stories each on both of the above categories appeared in the newspaper. However, among of the two, more importance has been given to farmer's rights by the newspaper. On farmer's stories, the paper had published 6 stories with 794.41 cm^2 of space on the front page and 28 stories with 4456.97 cm^2 on the inside page. As regards the harassment and intimidation 2 stories with 323.25 cm^2 appeared on the front page and the remaining 32 stories with 3876.01 cm^2 appeared on the inside pages. Stories related to state sponsored violence acquired the sixth slot on the line of importance given to stories on human rights. The paper published a total of 23 stories with a space of 3572.44 cm^2; of which 8 stories with 849.94 cm^2 on the front page and 15 stories with 2722.5 cm^2 appeared on the inside pages.

The rights of prisoners and suicide acquired seventh position in order of importance. Though equal number of stories (18 each) appeared among these two categories of news, the newspaper given more importance to the rights of prisoners. The paper has covered 2 stories with a space of 577.5 cm^2 on the front page and 16 stories with 2030.48 cm^2 on the inside pages on rights of prisoners. As regards suicide, all the 18 stories with 101.01 cm^2 appeared on the inside pages. Not a single story on suicide appeared on the front page during the study period. The eighth place in the order of importance given to extortion and money laundering. There were a total of 17 stories had been published in the newspaper. Of which 3 stories with 460.71 cm^2 of space on the front page and the remaining 14 stories with 1460.02 cm^2 of space on the inside pages. Malnutrition of children acquired ninth position in the slot. All the 15 stories on malnutrition appeared on the inside pages of the newspaper. Religious violence, sexual violence against women, and atrocities against tribals acquired tenth position in terms of the frequency of the coverage. 13 stories each published on these three categories. However, in terms of the space and coverage on front page, more importance has been given to religious violence. The newspaper had published 3 stories with 500.35 cm^2 on the front page and 10 stories with 1371.65 cm^2 on the inside pages. As regards sexual violence against women category, one story with 166.86 cm^2 on the front page and 12 stories with 1333.3 cm^2 on the inside pages of the newspaper. On atrocities against tribals one story with 189.75 cm^2 on the front page and 12 stories with 1226.97 cm^2 published on the inside pages. The eleventh position in order of importance given to atrocities against dalits. There were 12 stories published under this category, of which two stories with 47.54 cm^2 on the front page and 10 stories with 1623.67 cm^2 on the inside pages. The rights of refugees and child labour acquired twelfth position in order of importance given by the newspaper in terms of frequency of coverage. However, more prominence given to rights of refuges in terms of total space and coverage on the front page. The paper did not cover a single story related to child labour on its front page during the study period.

The fourteenth slot given to issues related to rights of minorities. A total of nine stories appeared in the newspaper, of which two stories published on the front page and seven on the inside pages. Rights of migrant workers and abduction acquired fifteenth position in the hierarchy in terms of number of stories covered by the newspaper. However, more importance has given to stories related to rights of migrant workers in terms of space. The sixteenth position in order of importance given to child abuse and molestation. All the six stories on this category published on the inside pages. Stories related to sedition, human trafficking and rights of disabled persons given seventeenth position in the hierarchy with four stories each published in the newspaper. However, sedition acquired more importance in terms of space and front page coverage. All of the stories related to human trafficking and rights of disabled persons published on the inside pages of the newspaper under study. All the three stories related to rights of elderly published on the inside pages. Two stories each related to women's reproductive rights, bonded/forced labour and honour killing published in the newspaper. However, among the three above mentioned categories, women's reproductive rights had got more prominence as the newspaper published one story on its front page. On manual scavenging only one story appeared on the inside pages of the newspaper during the study period.

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Relative Importance of Human Rights' Issues

Table-3: Placement of News

Placement of News	Frequency	Space in cm^2
Front Page	64	8415.32
Inside Page	526	82476.93
Total Coverage	590	90892.25

The placement of stories conveys a kind of importance, which, however, depends on the discretion of the newspaper editors – which stories should be placed on front page and which should be placed on the inside pages. Although the newspapers tend to cover stories under different sections and especially devoted pages, front page is still considered the most important. Focussing on this aspect of placement of stories, it was found that out of the total collected 590 stories, 64 were on the front page. Rest of the stories were on inside pages, which numbered 526. Area wise, out of the total 90,892.25 cm^2 area devoted to the issue in the selected study period, on the front page, 8,415.32 cm^2 space was given to stories, and 82,476.93 cm^2 space was on inside pages. Table-2 reveals that about 10 per cent of the stories relevant to human rights are published in the front page by the newspaper. Similarly, on the basis of space the paper allocated about10 per cent of the stories on the front page. Both in terms of space allocation and frequency of coverage on its front page, the Hindu seems to be given adequate importance to human rights issues in its agenda (refer Table-3).

Monthly trends of coverage

Table-4: Monthly trends of coverage

Month	Front Page Frequency (Space in cm^2)	Inside Page Frequency (Space in cm^2)	Front & Inside Pages Frequency (Space in $cm^{2)}$
January	11 (1393.98)	103 (17968.84)	114 (19362.82)
February	5 (463.19)	92 (16600.53)	97 (17063.72)
March	9 (1322.55)	82 (10151.52)	91 (11474.07)
April	14 (1624.06)	61 (6274.5)	75 (7898.56)
May	14 (2446.19)	93 (16513.79)	107 (18959.98))
June	11 (1165.35)	95 (14967.75)	106 (16133.1)
Total	64 (8,415.32)	526 (82,476.93)	590 (90,892.25)

It has been found from the study that on certain months of the year which have any grand festival or special day, the newspaper reduced the number of news to compensate advertisements. There were 590 stories spread over 90,892.25 cm^2 covered by The Hindu spanning six months' period. In the month of March and April the newspaper provided 11474.07 cm^2 space with 91 stories and 7898.56 cm^2 space with only 75 news items respectively. Likewise, February also witness less stories in number with 97 news stories spread over 17063.72. During the months of January, May and June, the paper covered more news related to human rights violations and in the above three months the paper published more than 100 news items, which shows newspaper's concern for issues related to human rights' violations (refer Table-4).

Framing of News

Table- 5: Selection of Frames

Type of Frame	Front Page Frequency	Inside Page Frequency	Front & Inside Pages Frequency
Media Referential	12	47	59
Media Trial	-	10	10
Oppressor	2	22	24
Pragmatic	8	41	49
Prognostic	9	39	48
Sensational	5	31	36
Victim	4	36	40
Total	40	226	266

The findings reveal that 59 news stories with media referential frame portrays the grassroots approach of the newspaper in covering news. Further, the journalists' of The Hindu adopted the pragmatic and prognostic frames while presenting human rights' issues. 49 and 48 news items contained pragmatic and prognostic frames respectively which ascertains the newspaper's concern towards issues related to human rights and their

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violations. The paper presented more number of stories with victim frames (40 stories), whereas the oppressor frame acquired less importance (24 stories). It is disheartening to note that a responsible newspaper like the Hindu presented 36 stories with sensational frames. The Hindu published 10 news items with media trial frames.

CONCLUSION

Not only electronic media but also newspapers are facing the criticism of being commercialised. However, contrary to the international scene, the circulation of newspapers in India continuously increasing, but it seems that the press has been detaching itself from the masses. National level newspapers, especially English language newspapers, seldom publish the news related to common people and rarely highlight their issues. In this backdrop, the Hindu seems to be detached itself from over commercialisation and dependence on government. It regularly publishes news related to legitimate grievances of the common masses. It also published a number of stories related to the problems and issues of farmers, dalits, tribals, women and children; adequate coverage has also been given to stories about naxalism/terrorism. The paper followed up the stories of rape, murder etc. in several cases as it also published the news of punishment of rapists/murderers etc. that shows newspaper's genuine attempts to enliven the ethics of journalism. The large number of stories with pragmatic and prognostic news frames also testify the newspaper's concern for human rights issues. The considerable amount of victim and oppressor frames suggest that the newspaper pay proper attention towards the sufferers. The results show that the newspaper under study is sensitive towards the legitimate grievances of the people while covering stories relevant to human rights issues and wherever necessary stood firmly against the abuses of human rights. Significant number of letters to the editor that have been published by the newspaper also testifies its concern for the rights of the people. The Hindu has published ten editorials and feature/articles under each category. More importantly, it has given much space to its readers to express their views on various aspects of human rights under the letters to editor column. In addition, it has also published a number of appealing photographs with sometimes thought provoking captions on human rights issues. At a time when readers are not served verifiable reports from the actual scene of happenings and half-baked stories are presented to its readers, The Hindu has set an agenda to pick and cover stories which affects day-to-day affairs of a human-being. Its coverage on human rights' issues mostly process-oriented rather than event or personality based which is a glaring trait of the newspaper. Issues and problems related to human rights need deep focus, extensive research, elaborate interpretation, and understanding on the part of both journalists and readers. News about human rights is to be regarded as separate, and the reporters covering it need to have a general understanding of the rights related to a human-being in a society and the intricacies of their problems.

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CHINA'S ECONOMIC REFORM AND OPENING UP, CHINESE LANGUAGE: AN OPPORTUNITY FOR INDIAN YOUTH

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ABSTRACT
The rise of Asia and growing global interconnectedness is reshaping the world as never before. China is central to this. An ancient Civilisation, rapidly growing economic and political power and home to one fifth of the world's population, China presents both opportunities and challenges. China is an important neighbour of India at the same time considered as one of the rising economic giants in Asia. The rise of China indeed has very important role World affairs. The Economic reform and Opening up of China has increased the important of its language across the globe. Mandarin (普通话) is official language spoken and written throughout China. All most all official documentation and meetings are carried out in this language. Therefore, it has substantially increased the opportunities for the language learners who are mostly youth. In this backdrop, the paper will address the following questions:

a) What is the current status of Chinese language learning and teaching in India?

b) What are the measures need to be adopted to popularize Chinese language in India?

c) What are the opportunities for the Indian Youth

d) An important tool to understand India and China Culture

Keywords: Economic reform and opening up, Chinese language, Youth

INTRODUCTION
The rise of Asia and growing global interconnectedness is reshaping the world as never before. China is central to this. An ancient Civilisation, rapidly growing economic and political power and home to one fifth of the world's population, China presents both opportunities and challenges. China is an important neighbour of India at the same time considered as one of the rising economic giants in Asia. The rise of China indeed has very important role World affairs. Mandarin (普通话) is official language spoken and written throughout China. All most all official documentation and meetings are carried out in this language.[1] China is still a myth for so many countries in the world as the official language of communication is only Chinese /mandarin. All of the important speeches delivered by the Chinese leadership are in Chinese language and it would be very difficult to understand them with knowing the language and its culture. The rate of its economic growth in double digits in the early and middle phase of 'Economic reform and Opening up'[2] has created ripple in the mind of the economist across the globe. Nobody had imagined that once having a label of "sick nation of Asia" can rise in such speed top get the label of "World factory"[3].

Apart from its aspirations of becoming Economic power, China also wants to extend its presence in each and every part of the world through its various policies. The economic exchange and people to people contacts has increased substantially with rise in Chinese economy. China having the status of being the "World factory" is currently facing difficulties in maintaining its status. It is happening due to rise in ageing population, which witnessed the short fall of young labour. In the absence of supply and constant rise in demand has put labourers at upper age of bargaining. It has resulted in rising of the labour cost. The rise in labour cost and slowing economic growth in China has made Chinese manufacturing units to move outside China and look for better avenues to get cheap labour. In this backdrop India and African countries can be the best choice for these companies. India by 2025 will be having maximum number of youth between the ages of 15 to 35 years with average age of 25 years.

[1] Note: Apart from the official language Mandarin, China has many different languages and dialects spoken in various parts of China..

[2] Note:China began its Economic reform and Opening Up in 1978 under the leadership of Deng Xiaoping. Before that China was more closed and isolated from the outside world.

[3] Bajpai, Prableen," "Why china ids World factory" http://www.investopedia.com/articles/investing/102214/why-china-worlds-factory.asp?lgl=rira-baseline-vertical accessed on 19/7/17 at 12:39 pm

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Secondly, China wants to expand itself diplomatically with the other country and recent development suggest that it has successfully managed to establish its diplomatic relations with the Indian neighbour through gaining projects in the country especially the sea ports. For instance, China's OBOR initiatives (一带一路), which has made 86 countries over the world to participate in its initiative is definitely going to change the global order at least in economic front. The total budget for OBOR/BRI is more than 250billion USD.

With growing economic and diplomatic importance and in the backdrop of recent India China Military standoff at Dokla plateaus since June 16, 2017 to August 28, 2017 and ended after both side agreed to maintain status Quo. Few commentators on China and Indian Television talk/debate also pointed out the communication gap between the Indian Army and Chinese PLA military personnel led to the DOKLAM Standoff between these two neighbours. In this backdrop, it has become more important to analyse the status of Chinese language learning in India and what are the new measures to be adopted to popularize the learning of foreign language in India especially, the Chinese language. Its language has to be spoken understood by the Indian people in general and its youth in particular to maintained robust friendly relation as well as partnership with China. India and China can both mutually benefits each other from their economic growth. The study of its socio-economic, political and cultural aspects can be of great value to our Indian people.

HISTORICAL BACKGROUND: CHINESE LANGUAGE IN INDIA

Talking about history of the Chinese language in India, it has travelled a long journey of almost 95 years. As rightly observed, socio-economic situation, culture, Politics changes in every 10 years. I am not denying the fact that there have been changes in Chinese language teaching and learning curriculum, however, those changes are minimal in comparison with the changing world order, especially on economic front in India.

The Chinese language was introduced in India with the prime objective to understand and re-established civilizational contacts between India and China. It began with the learning of Classical language and literature. The students were advised to learn classical language in order to decode Buddhist classical literature.[1]

The history of foreign language teaching in Calcutta University is almost as old as a century. In 1917 studies in foreign languages started with the teaching of Tibetan, Chinese, German and Dutch. These were followed by French and Japanese (1918-19), Portuguese (1924-25), Italian (1929-30) and Polish (1939-40). When the Second World War broke out, some of these languages were withdrawn because the foreign teachers who were teaching these languages left India.[2]

Vishwa-Bharti was the second to started Chinese language programme at Cheena Bhavana (Institute of Chinese language and culture in April, 14 1937 by Rabindranath Tagore under the Chairmanship of Tan Yunshan.[3] The aim of establishing this institute was to promote cultural between India and China.

"The hall which is to be opened today will serve both as the nucleus and as a symbol of that larger understanding that is to grow with time. Here students and scholars will come from China and live as part of ourselves sharing our life and letting us sharing theirs and by offering their labors in a common cause, helping in slowly rebuilding that great cause of fruitful contact between our peoples ,that has been interrupted for ten centuries.(Tan Yun-shan1957:42)"[4]

It is also important to know the aim and objectives of the institution as laid by Visva-Bharti:

"The object of this department (Cheena-Bhavan) shall be to establish and promote cultural exchange between China and India, for which purpose it will provide facilities for Chinese scholars to study Indian languages, literature, history, religions, philosophies, etc. as well as for Indian scholars to study Chinese, language, literature, religions, philosophy, etc…Buddhism being regarded as the nucleus of all such studies.[5]

Nava Nalanada Maha Vihara (Deemed University) under the Ministry of Culture (Government of India) was the initiatives of our first President of India Dr Rajendra Prasad. He initiated the Idea and declared that the

[1] It has been observed by visiting the oldest library, most of their archives have Buddhist Texts and studies are been conducted in classical Chinese . Library such as Cheena Bhavan, Nava Nalanda Mahavihara, BHU etc and their major research are on Buddhist studies.

[2] http://www.caluniv.ac.in/academic/department/Languages.html downloaded at %:46 pm on 21/4/17

[3] http://www.visva-bharati.ac.in/map/contents/cheenabhavan.htm downloaded at 4:45pm on 21/4/17

[4] Tan Chung, Amiya Dev , Wang Bangwei,Wei Liming (Ed) *Tagore and* China , New Delhi, Sage Publication,2011

[5] Ibid,

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ancient seat of Buddhist learning would be revived and that idea became instrumental in establishment of the Nava Nalanda Mahavihara in with the laying of the foundation stone on Novemebr20, 1951 Then came the School Of Foreign Languages established by the Ministry of Defence in 1948, having main objectives of imparting training in various foreign language to its personnel of the Armed forces and other government departments and equipped their personnel to have adequate knowledge so that communication should not be the barrier in protecting and safeguarding the sovereignty of our country. The Institute got its permanent status in 1954 in recognition of the strategic importance of foreign language teaching.[1]

There was break in the continuity of the teaching Chinese language due the outbreak of War of 1962 between India and China. After the war, the importance of the learning Chinese language become more important to understand China and as a result of that centre for Chinese studies established in 1964, with active participation and headship of Prof. V.P. Dutt who was quite active in Chinese studies.[2]

Then Jawaharlal Nehru University which was established in1969 has a vision to understand the foreign society, polity and diplomacy through their language, literature and Culture of that country, established School Of languages, which later renamed with the addition of School of Language, Literature and Culture Studies as the school and its department were not and is not only restricted to the language studies. The students and scholars of this school have done exemplary research work on various issues on culture and society apart from the research on languages. This school of Language, literature and culture studies has taken over the role of resource pool. It has been providing foreign language faculties to the other parts of the India.

THE CONDITION THAT SHAPED THE FUTURE OF CHINESE LANGUAGE LEARNING IN INDIA

The adaptation of policy of Economic reform and opening up of China in 1978 provided impetus to the growth of Chinese language and China s studies in India. India though late, initiated economic reform and liberalization in 1990s. Therefore, the objectives and motives of introducing Chinese language in various universities too have changed. For instance, Contemporary Scenario is totally different from the past. “Economic gain”, individual ambition to earn money and better living standard has become the motives of learning the language at macro-level of the India Youth. The Indian Market is providing lot of choice in form of electronic gadgets, branded shoes, automobile etc. As lot of MNCs are providing job to the graduates and post graduates fresher with good salary packages unlike past. There were less private companies or firms before 90s and major stake of private jobs were with the few companies such as Tata, Birla and others .The major jobs were the government jobs or left to work with the family. These have deep influence on the India’s Youth culture.

According to statistics published by FICCI[3], India, the no of Chinese companies which has already established its permanent office in India are more than 30 which include major Giants Giants like Sinosteel ,Shougang International ,Baoshan Iron & Steel Ltd,

Sany Heavy Industry Ltd ,Chongqing Lifan Industry Ltd, China Dongfang International, Sino Hydro Corporation, Huawei Technologies, ZTE TCL Haier Shanghai Electric,Harbin Electric, Dongfang Electric Shenyang Electric Beijing Automotive Industry Corporation (BAIC) ZTE Kangun Telecom Company (I) P. Ltd ESSEL Ahmedabad Godhra Toll Roads Ltd Shanghai Electric India Pvt Ltd TBEA Energy (India) Ltd TBEA Energy (India) Ltd CHENGUANG Bio-Tech(India) Pvt Ltd Ecolutions Green Energy (India) Pvt Ltd YAPP India Automotive Systems Pvt Ltd XINDIA Steels Ltd. Nippon Paint (India) Pvt Ltd XINDIA STEELS LTD. Cheetah Multitrade P. Ltd. Jushi India FRP Accessories ZTE, etc. These companies are looking for Chinese language sources especially the resource which has deep and fluent knowledge of Chinese and technical knowhow. These companies are ready to pay the desired salary to the suitable candidates but they are not getting enough candidates to recruit. The total trade India and China in 2013 was 65.85 billion Us dollar , which increased to ----------in 2015 and 2016. With the betterment of India and China relations, its can go much higher than expected.

In reciprocal there are many Indian Companies has established its base in China which too needs Chinese resource both from India and China. Such as, Adani Global

Air India Apollo Tyres Aptech Worldwide Inc. Aurobindo (Datong) Bio-Pharma Co. Ltd. Bank of Baroda Bank of India Bharat Forge (Changchun) Co. Ltd. Canara Bank

[1] http://sflmod.nic.in/ downloaded at 27/4/17 at 2:02pm

[2] https://en.wikipedia.org/wiki/Department_of_East_Asian_Studies,_University_of_Delhi downloaded at 5:42pm on 21/4/17 Delhi University www.du.ac/index.html

[3] http://ficci.in /international/75154/Project_docs/China.pdf downloaded at 1:54 pm on 8/5/17

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Dr. Reddy's Laboratories Essar ICICI Bank iGate Global Solutions Limited India Grasim Industries Ltd Infosys Technologies Ltd Jindal Steel and Power Limited JSW Steel Limited Jubilant Organosis Ltd Larsen & Toubro Limited Mahindra(China)

Tractor Co. Ltd Punjab National Bank Reliance Industries Limited Shipping Corporation of India State Bank of India Steel Authority of India Limited Suzlon Energy (Tianjin) Limited TATA Autocomp Systems Limited (TACO) TATA Sons Limited TVS Motors Co. Ltd Wipro (Shanghai) Limited

Punjab Technical University which was established in the year 1997 came out with various engineering and management institutes across Punjab and introduced foreign languages especially Chinese to equip their Students with the Chinese language and get better placement. These courses are not at par with the regular courses i.e. Bachelor, Post graduate and above. [1]

Central University of Jharkhand, and other Central University and few state universities such as Doon University, Marathawada University too has Chinese language programme with Doon University have full time Bachelor and Masters programme and Marathawada University has diploma and certificate programme for the students.

Apart from the Universities, Engineering Colleges and Management institutes too have Chinese language programme. These departments cater to local students in great number but could not able to retain the numbers in other stage.

In nutshell, in recent years the motive of learning has witnessed substantial shift from literature oriented teaching programme to language oriented programme.

PROSPECTS OF CHINESE LANGUAGE LEARNING IN INDIA

What kind of skills and humans capital wills Indian students in particular and Youth in general will need to be success in this new global age? Young Indian growing up and seeking their place in global society need knowledge and skills that differ from those of the previous generation. In addition to their professional qualifications, they will need to develop global competencies. These competencies include knowledge of other world, regions, and cultures and in communicating in language other than Hindi or English.

The No of Chinese tourists too has increased many folds, the tourism Industry too is facing huge dearth of Chinese language speaking tourist guides and facilitators. With the gaining international presence of China, There is upsurge in establishment of China Think Tanks who wants to employ scholars who are well versed in Chinese language and have knowledge of China studies. The increase in people to people contacts has increased the demands of the consecutive and simultaneous interpreters, which limited resource pool, cannot cater to the increasing demands of the market.

According to the 2011, Census, published by the Central Statistics Office, Government of India , that's 34.8percent of Indian population are youth and India stands youngest nation of the world and would continue to remain in other 20 years. Indian government has recognised the importance of being able to understand and communicate with foreign countries and opened so many foreign language institutes and departments in various parts of the Country. Central Universities like, Central University of Jharkhand, Central University of Sikkim, Central University of Gujarat and more are the examples. Some of them Bachelor and Master Courses in Chinese languages but other universities has either certificate or diploma courses which are not well equipped to cater to the Chinese market demand.

CHALLENGES WHICH ARE SLOWING DOWN THE DEVELOPMENT OF CHINESE LANGUAGES AND CHINA STUDIES PROGRAMME IN INDIA

Reasons of less number of takers of Chinese language in India

1. Inability of our Course Structure to attract the students to learn the language: The courses taught in the bachelor and masters are mostly literature based or translation of the important news from China (Journalistic Chinese). India being developing countries and grappling with economy disparities and unemployment cannot afford to be unidirectional. It needs to have a very pragmatic approach in dealing with these issues. Most of the learners of the foreign language are from Uttar Pradesh, Bihar and Rajasthan or regions bordering China. Among them also it has been seen that students whose home town has tourist connection are more in percentage. Large chunks of youth are unemployed and come from economically poor background. They want to earn livelihood first and then they choose to become scholar.

[1] http://ptuforeignlanguages.ac.in/# downloaded on 27/4/17 at 1:42 pm

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2. General perceptions and ignorance of the Indian people towards the Foreign Language. India is a country where 90% of people think that working in government sector with little salary is far better and secure than working in private companies with higher positions and pay. One Anecdote "A student of Chinese language once visited his home town in countryside. People asked him about his study, he replied that he is studying foreign language. To my surprise and dismay, People responded by saying that fine! What else are you studying----?? It reflects the ignorance of these people who don't even know that foreign language too is at par with the other steam like sciences and history etc---. In these kind of situation, how one can think beyond the conventional courses offered by the universities and colleges. This kind of mind set is one of the important factors in the increase of the unemployment especially amongst the Indian youth.
3. The degree of difficulty in learning the language due to its Pictographic and tonal Characteristics is a factor but cannot be the only factors causing alienation from learning Chinese language. Limited career options and infrastructure and unawareness about the foreign languages too have to be blamed.

With the aforesaid reasons, the course structure for foreign languages must design according to our domestic and global need. The importance of knowledge of speaking and understanding foreign language has been recognized by many countries of the world and some of them have made compulsory courses in their academic curriculum.[1] India and Indian stills cherish the conventional professional courses such as medical and engineering etc.

WHAT TO DO

1. The Course must be designed taking in consideration of the multi-lingual scenario of India speakers. Our present Course curriculum only teaches the Art, literature, history, geography, and politics of the target country. The undergraduate student s who takes admission to the foreign Language Courses has rare chance to learn about their own country. Although our Course Curriculum states that apart from teaching foreign Language (i.e. Spoken & Written), knowledge of Culture, Society, Polity, Economics etc too, are taught to the students. But going through my personal experience and other colleagues of my centre, it is general saying about our students that, "They are very good in speaking the language but equally very bad in understanding of that Country." As a result very few students continue their further research in the language.
2. The examples and quote cited in text books and in its contents should be of inter-Culture in nature. It should also have some element of intra-culture aspect. This will generate association with the language and generate interest among the learners.
3. It should also cater to the different Examinations Pattern of Indian government services. The learners should not have one notion of becoming translator and tourist guides.
4. Need to start awareness drive to make masses aware about the Foreign Language.
5. Establishing more centres to impart regular Undergraduates, Post Graduates and Research Programmes in Various University of India.

There was sincere efforts from the India and China government to strengthened Chinese language teaching in India and create a huge pool of Chinese language professionals in 2012, when CBSE formed a committee to prepare Chinese Syllabus for its affiliated Central schools in India . The Indian and Chinese government tried to bridge the language barrier by sending their Chinese teachers and inviting Indian teachers to train them in Chinese language. These initiatives were taken by the Chinese government in the year 2012. [2]

As Reuters reported

"These initiatives of collaboration was not only limited to the schools , it was also to establish Confucius Institutes in India , fully funded by the HANBAN(汉办) in collaboration with top universities in India but encountered technical glitch in course of its establishment."[3]

[1] As the Committee of Economic Development (CED) of America declared in its report, Education for Global leadership," To educated American of the twenty-first century will need to be conversant with at least on language in addition to his or her native language and knowledge about other countries, other cultures and the international dimensions of issues critical to the lives of all American."

[2] http://www.firstpost.com/world/why-china-is-helping-indian-teachers-learn-chinese-430315.html downloaded at 4:32 pm on 211/4/17

[3] ibid

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In recent development, Center of Chinese and Southeast Asian studies, Jawaharlal Nehru universities, India and Tsinghua University, Taiwan convened a joint workshop of curriculum making, which may address not totally but partial requirement of syllabus as observed above.

At the end, there is a great prospects of Chinese language in India, provide some lacunae in syllabus are rectified. The learners should be given more options to choose in order to achieve ones future ambitions and proudly contribute in taking India on the path of faster economic development in near future. I is well said about the youth, "Young ones when nourished properly can grow like a huge redwood tree but if not controlled or neglected can erupt like volcano"[1]

The awareness of learning foreign languages should not be only restricted to the urban areas but should be taken into the rural areas in order to bring awareness among the Youth who were only aspiring to become Civil Servants or to somehow get government job. The growth in foreign language professionals can attract many foreign investment that to form China and create a good job opportunities for the unemployed youth in India.

Present Government has started a new chapter in its skill development programme. India youth are going to China to learn Chinese language in huge numbers to learn language, if we create good infrastructure such as Institute of Interpretation and translation and give top class training to its youth , will not draw only Indian Youth , it will attract so many foreign students interested in learning this courses.

CONCLUSION

With the above findings, it has become very important for India to accelerate the foreign language learning and promotion not only in the urban areas but also in the hinterlands. The initiatives not only create employment opportunities for our growing youth population in future, at the same time will help India to understand China comprehensively. The criticism that has been coming from China and India media can be responded by taking this initiatives and preparing our future 'Think Tanks' to access the primary sources and information, which are only focussed to domestic audience. This time is the best time when the economic growth of China is much better than the other countries. Indian youth can be motivated to learn this language, if they are introduced about the economic prospect of learning the language. It will not only a great step forward in reducing unemployed but it will also help in eradication misunderstanding about both culture of both Countries. Language learning cannot be done in isolation; it is a complete package of language, literature and culture. If the youth of India are encouraged to learn Chinese language and Chinese youth to learn India languages, they can mark the new beginning in India China people to people exchange that may led to gradually increase in friendship between the two nations. The Youth of both nations can further cement the bond as aspired in this Chinese saying, "远亲不如近邻"

[1] Youth In India 2017 , Central statistics Office , Ministry of Statistics and Programme Implementation Government of India (Social Statistics division)

MANUSCRIPT SUBMISSION

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1. Manuscripts should be submitted preferably through email and the research article / paper should preferably not exceed 8 – 10 pages in all.
2. Book review must contain the name of the author and the book reviewed, the place of publication and publisher, date of publication, number of pages and price.
3. Manuscripts should be typed in 12 font-size, Times New Roman, single spaced with 1" margin on a standard A4 size paper. Manuscripts should be organized in the following order: title, name(s) of author(s) and his/her (their) complete affiliation(s) including zip code(s), Abstract (not exceeding 350 words), Introduction, Main body of paper, Conclusion and References.
4. The title of the paper should be in capital letters, bold, size 16" and centered at the top of the first page. The author(s) and affiliations(s) should be centered, bold, size 14" and single-spaced, beginning from the second line below the title.

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5. The abstract should summarize the context, content and conclusions of the paper in less than 350 words in 12 points italic Times New Roman. The abstract should have about five key words in alphabetical order separated by comma of 12 points italic Times New Roman.
6. Figures and tables should be centered, separately numbered, self explained. Please note that table titles must be above the table and sources of data should be mentioned below the table. The authors should ensure that tables and figures are referred to from the main text.

EXAMPLES OF REFERENCES

All references must be arranged first alphabetically and then it may be further sorted chronologically also.

- **Single author journal article:**

Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

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- **Text Book:**

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.

S. Neelamegham," Marketing in India, Cases and Reading, Vikas Publishing House Pvt. Ltd, III Edition, 2000.

- **Edited book having one editor:**

Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

- **Edited book having more than one editor:**

Greenspan, E. L., & Rosenberg, M. (Eds.). (2009). *Martin's annual criminal code:Student edition 2010.* Aurora, ON: Canada Law Book.

- **Chapter in edited book having one editor:**

Bessley, M., & Wilson, P. (1984). Public policy and small firms in Britain. In Levicki, C. (Ed.), *Small Business Theory and Policy* (pp. 111–126). London: Croom Helm.

- **Chapter in edited book having more than one editor:**

Young, M. E., & Wasserman, E. A. (2005). Theories of learning. In K. Lamberts, & R. L. Goldstone (Eds.), *Handbook of cognition* (pp. 161-182). Thousand Oaks, CA: Sage.

- **Electronic sources should include the URL of the website at which they may be found, as shown:**

Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

- **Unpublished dissertation/ paper:**

Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

- **Website of any institution:**

Central Bank of India (2005). *Income Recognition Norms Definition of NPA.* Retrieved August 10, 2005, from http://www.centralbankofindia.co.in/ home/index1.htm, viewed on

7. The submission implies that the work has not been published earlier elsewhere and is not under consideration to be published anywhere else if selected for publication in the journal of Indian Academicians and Researchers Association.

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