Chapter - V

SUMMARY, CONCLUSION AND DIRECTION FOR FUTURE STUDIES

5.1 Summary

Chapter - I

Introduction

Technology has dominated all spheres of life. The education is also one of the fields where we can see the impact of information technology. Over several years the education process has seen drastic changes in imparting knowledge. During the last few years it has been seen, an almost exponential development and growth of the digitalization, automation and the internet, with little sign of a slow down. No longer is internet access restricted to a few select education establishments it is now available to anyone in their place of work, local libraries, the internet cites and even in the home. It is the information that has becomes the key to the success in different walks of life.

Changing Scenario:

According to John Chambers (2001,Rosenberg), “the biggest growth in the Internet, and the area that will prove to be one of the biggest agents of change, will be in E-learning.” Alvin Toffler’s declared (2001) that “the illiterate of the 21st century will not be those, who cannot read and write but those who cannot learn, unlearn, and relearn.” An ancient proverb says: “if we don’t change our direction, we’ll end up exactly where we are headed”. This indicates that everyone will have to constantly change and adapt the new learning styles if they are not to lag behind.
Today the Internet has become an important instructional tool to facilitate the transfer of many types of information from one computer to another, and is rapidly becoming an effective means of communication in schools and colleges. Internet-based instruction has been manifested in one-to-one (tutor-to-student), one-to-many (tutor-to-group) and many-to-many (group-to-group) approaches to instruction. E-learning has grown tremendously over the past several years as technology has been integrated into education and training. Koprowski (2000) estimates and suggest that the amount of money U.S. companies spent on the IT-based delivery of training grew from $3 billion in 1999 to $11 billion in 2003. Gold (2003) described, the worldwide market for e-learning is projected to be more than $18 billion by the end of 2005, and with some organizations projecting that over half of their training and education will be delivered electronically over the next five years.

**Concept of Learning:**

Learning occupies a very important place in our life. Most of what we do and not do is influenced by what we learn and how we learn it. Learning, therefore, provides a key to the structure of our personality and behaviour. Broadly speaking, the term learning stands for all those changes and modifications in the behaviour of the individual, which he undergoes during his lifetime.

**Concept of Traditional Learning:**

The traditional learning comes in basic four forms: Classroom sessions, The Lab sessions, Library sessions and Collaborative Learning.
The Concept of Distance Learning:

The term “distance education” represents approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and group of learners. The terms “distance education” and “distance learning” are used to cover any situation when the student and teacher are not in the same place. The openness presupposes the availability of education - anyone, anyway, anywhere and anytime without social, physical and geographical restrictions. Open and distance learning is usually contrasted with ‘conventional’ or face-to-face’ education, which may be described as the form of education which takes place in a classroom or an auditorium.

However, both ‘distance’ and ‘face-to-face’ education are labels covering a wide range of variations and methods. ‘Face to face’ education may be supported by a range of media, and may be combined with periods of independent study.

History of Distance Learning:

Historically, distance education can be traced back to the 18th century, to the beginning of print-based correspondence study in the US. In the mid-19th century correspondence education started to develop and to spread in Europe and the United States. Isaac Pitman, the English inventor of shorthand, is generally recognized as the first person to use correspondence courses. Open and distance learning in India dates back to the 1960s. By the 1980s there were 34 universities offering Distance education through departments designed for that purpose. The first single mode Open University was established in Andhra Pradesh in 1982, followed by the Indira Gandhi National Open University (IGNOU), and subsequently in Bihar, Rajasthan, and Maharashtra,
Madhya Pradesh, Gujarat, Karnataka, West Bengal, and Utter Pradesh (established throughout 1980s and 1990s). The establishment of these single mode distance education universities was stimulated by the government’s intention to democratize education and make it lifelong. The year 1995 witnessed the enrollment of 2,00,000 students in open and distance learning, accounting for 3% of total higher education enrollment. In the late 1980s, and early 1990s the development of the fiber optic communication systems, in other words the use of networking and Internet, allowed for the expansion of live, two-way, high quality audio and video systems and the new concept of **Electronic-learning** comes in education.

**Concept of E-learning :**

The term E-learning means Electronic Learning and it is basically the online delivery of information communication, training and learning. E-learning involves the use of computers and Internet to aid in the learning process. If a computer is a standalone, then we have Computer Learning (CL) that can be used either Computer Based Learning (CBL) or Computer Assisted Learning (CAL). CBL involves the computer taking the place, for the most part, of the teacher, and is popular in distance education. CAL involves a teacher using E-learning to supplement face-to-face teaching. This also applies to the Internet with web page access. As with CL, Online Web Learning (OWL) can either be Online Web Based Learning (OWBL) or Online Web Assisted Learning (OWAL).

**Related Terms to E-learning :**
Related terms include Distance Education, Online Education, Distributed Learning, Internet Education, Computer-based Training, Computer-Mediated Communication, Computer-Assisted Instruction, Virtual Education, Cyber-Learning, Asynchronous Learning and Blended learning/Multi-model instruction.

Types of E-learning:

There are four types of E-learning:

1. Self Study sessions,
2. Asynchronous Learning,
3. Synchronous Learning and

Strengths of E-learning

Some major strengths of E-learning are:

1. Learning is self-paced and gives students a chance to speed up or slow down as necessary.
2. Learning is self-directed, allowing students to choose content and tools appropriate to their differing interests, needs and skill levels.
3. Accommodates multiple learning styles using as variety of delivery methods geared to different learners, more effective for entrain learners.
4. Students can participate in classes from anywhere in the world provided they have a computer and Internet connection.
5. Geographical barriers are eliminated, opening up broader education options.
6. 24/7 accessibility makes scheduling easy and allows a greater number of
people to attend classes on demand access means learning can happen precisely when needed travel-time is reduced or eliminated.

7. Overall student costs are comparatively less (tuition, residence, food).
8. Potentially lower costs for companies needing training and for the providers.
9. Fosters greater student interaction and collaboration.
10. Fosters greater student/instructor contact.
11. Enhances computer and Internet skills.
12. Draws upon hundreds of years of established pedagogical principles.
13. Has attention of every major university in the work, most with their own online degrees, certificates and individual course.

**Objectives of E-learning :**

The objectives of E-learning are:

1. To access educational resources from outside the institution on global and instant basis.
2. To obtained quick and easy way to create, update and revise course materials.
3. To increase the flexible interaction with student through e-mail and discussion forums.
4. To obtained location and time independent delivery of course materials such as course notes, diagrams, reading list, etc.
5. To prepare quality-learning materials, ability to combine text, graphics and a limited amount of multimedia, enabling instructional designers.
6. To increased learner control through hypertext based presentation of information.

7. To obtain opportunities for international, cross culture and collaborative learning.

8. Ability to serve a large number of students at a potentially reduced cost.

9. To develop self-learning ability.

**Need of E-learning in India:**

India has the world largest illiterate population and second largest population. Numerous governments tried to eliminate illiteracy completely from India but failed simply because of its enormous geographic spread and huge population. However the advent of E-learning in India has made this task easier and achievable.

**Traditional Learning versus E-learning:**

Technological learning has many more advantages that traditional learning. You can learn when it's convenient for you, not Monday Wednesday Friday at 12 noon. Someone that works full-time can still be able to get some courses done at night or on weekends. Those people who live out of town or who live in a town with no university do not need to worry about commuting or moving just to attend school. On the other hand one of the serious issues that come with technological learning is self-discipline. When people are at home they tend to be distracted very easily. Self-discipline is also an issue in the work place, but when you sit in an office you tend to do your work.

The biggest problem with technological learning is the lack of knowledge many people have about computers and the Internet and lack of environment provided by the institution. Availability of technological learning environment for educating student feels
them comfortable. Traditional learning may not be as successful in teaching retainable education, but they offer socialization. We need to collaborate both traditional learning and technological learning. Traditional learning would offer the one on one and socialization that people need and technological learning would teach the students how to use the necessary tools to apply to everyday situations.

**The Implications of E-learning for Lecturers**

The efficiency of technology enhanced learning and teaching depends on several factors. Most important of them are: 1) Suitable technological tools 2) Appropriate didactical approaches 3) High level competence of lecturers 4) Positively motivated lecturers and students.

**The Implications of E-learning for Students**

It is widely acknowledged that implementation of E-learning leads to a fundamental shift in learning styles; however research into the effects of this shift is inconclusive. Knight (1996) proposes that E-learning will benefit students who are used to being ‘spoon fed’ on the basis that students can no longer be passive about their learning. This view is endorsed by Hawkes and Cambre (2000) who claim that in order to gain results, students must take responsibility for their own learning. And in contrast to Knight, the views of Kershaw are noted. Kershaw (1996) proposes that, students will not automatically become careful, self motivated individuals and that success in fact depends on the level of interaction between students and lecturers that is required to stimulate good results.

**External factors driving E-learning :**
According to Middlehurst (2001) Mc. Burnie (2001) external factors influencing the inner life of higher education institutions, including the use of ICT, can generally be distinguished into: economic, social, cultural, and technological factors as well as the changing role of governmental policy.

**Need And Importance Of The Study:**

In a world where change is the only constant there is a need for tools techniques to help institutions become more effective. In the twenty first century, people are fading up with old styles, they need change very fast. To stay in the competing world, Institutions have to take initiatives to compete with all the challenges of changing world. "**Change your self before they change you**". A McKenzie report has indicated that by 2008 we need to develop over 2.2 million IT knowledge workers. According to Goddard (1998) the demand for higher education is expanding exponentially throughout the world and by 2025 as many as 150 million people will be seeking Higher Education. Yet the current education system seems to be unable to equip students with variety of these skills. Fortunately, E-learning has the answer to all of these issues. E-learning environment is a real boon of ICT application. The notable point is that the new E-learning model can co-exist well with the traditional learning environment. It not only makes distance learning easy, but also enhances the classroom-based teaching. Today E-learning and E-learning environment is very essential for every field like Medical, Dental and Engineering college to improve the quality of education. Hence it is very important to find out the effect of Traditional learning and E-learning on the students academic achievement. That’s why the researcher realizes the importance of the present study.
Selection of the Problem

The interest in E-education is growing very rapidly in India. The Ex-President of India Dr. APJ Abdul Kalam announced a vision plan that envisaged an empowered science and technology based by 2015 by saying that there is a need to energies our university system and enable it to respond to the pressure of the market, so that it can retain and attract talent. A large number of studies compare student achievement between web-based learning versus traditional delivery models. Mock (2000) Ryan (2000) suggested that achievement test scores of students in the online and in the face-to-face classes were either statistically equivalent, comparable, or roughly at the same level. By considering the Indian situation of higher education and after going through the above studies there are some questions arise with traditional learning and E-learning and for that researcher first wants to check:

1. Is there a sufficient knowledge and attitude of students and lecturers have about the E-learning?
2. Is there have an environment and facilities provided by the institution?
3. Is the traditional learning or E-learning or both methods are essential for better academic achievement?
4. Is there a positive attitude of E-learning compared to traditional learning of Medical, Dental and Engineering students?
5. What should be the academic outcomes of the students by E-learning than traditional learning?

Thus the present researcher has decided to take up this study for investigation and state the problem as under.
Statement Of The Problem :

"A STUDY OF TRADITIONAL LEARNING AND E-LEARNING OF FINAL YEAR STUDENTS OF MEDICAL, DENTAL AND ENGINEERING AND THEIR EFFICACY ON THEIR ACADEMIC ACHIEVEMENTS".

Operational and Functional Definitions :

Study -

To take pains for acquiring knowledge for practice or for an experiment.

Traditional Learning -

Teaching methods, which are generally used to teach various subjects in the class.

E-learning -

In present study Electronic learning or E-learning is learning method can be used in conjunction with face-to-face teaching, to find out the effect on academic achievement of the students of Medical, Dental and Engineering.

All the Medical, Dental and Engineering are the professional courses so the definition of the professional course is –

- Professional Course –

"The knowledge or skill obtained or developed by learner for particular profession."

Academic Achievement –

Merriam Webster defines Achievement as –
“The quality and quantity of a student's work” and hence academic will be the whole year's scholastic work done by a student.

**Objectives Of The Research Study:**

The main objectives of the research study were–

1. To construct an attitude scale for measuring the attitude of final year students of Medical, Dental and Engineering colleges towards Traditional learning and E-learning.
2. To construct a opinionnaire for measuring the attitude of lecturers of Medical, Dental and Engineering colleges towards Traditional learning and E-learning.
3. To measure the attitude of students of Medical, Dental and Engineering colleges towards Traditional learning and E-learning.
4. To measure the attitude of lecturers of Medical, Dental and Engineering colleges towards Traditional learning and E-learning.
5. To compare the attitude of male and female final year students of Medical, Dental and Engineering colleges towards Traditional learning and E-learning.
6. To measure the effect of Traditional learning and E-learning on the academic achievement, by collecting the final examination marks obtained by the final year students of Medical, Dental and Engineering.
7. To compare the efficacy of traditional learning, E-learning and both learning on the academic achievement of final year students of Medical, Dental and Engineering.

**Hypothesis Of The Research Study:**

The hypotheses of the present research study were:
1. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards behavioural factor of E-learning.

2. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards affective factor of E-learning.

3. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards cognitive factor of E-learning.

4. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards behavioural factor and affective factor of E-learning.

5. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards behavioural factor and cognitive factor of E-learning.

6. There is no significant difference between the male and female final year students of Medical, Dental and Engineering towards affective factor and cognitive factor of E-learning.

7. There is no significant difference between the male and female final year students of Medical towards Traditional learning.

8. There is no significant difference between the male and female final year students of Dental towards Traditional learning.
9. There is no significant difference between the male and female final year students of Engineering towards Traditional learning.

10. There is no significant difference between the male and female final year students of Medical and Dental colleges towards Traditional learning.

11. There is no significant difference between the male and female final year students of Medical and Engineering colleges towards Traditional learning.

12. There is no significant difference between the male and female final year students of Engineering and Dental colleges towards Traditional learning.

13. There is no significant difference between the Traditional learning and E-learning of male and female final year students of Medical colleges.

14. There is no significant difference between the Traditional learning and E-learning of male and female final year students of Dental colleges.

15. There is no significant difference between the Traditional learning and E-learning of male and female final year students of Engineering colleges.

16. There is no significant difference between the Traditional learning and E-learning of male and female final year students of Medical and Dental and Engineering colleges.

17. There is no significant difference between the efficacy of Traditional learning and both learning on academic achievement of final year students of Medical, Dental and Engineering.

18. There is no significant difference between the efficacy of E-learning and Both learning on academic achievement of final year students of Medical, Dental and Engineering.
19. There is no significant difference between the efficacy of Traditional Learning and E-learning on academic achievement of final year students of Medical, Dental and Engineering.

20. There is no significant difference between the efficacy of Traditional learning and E-learning and Both learning on academic achievement of final year students of Medical, Dental and Engineering.

21. The attitude of Lecturers of Medical, Dental and Engineering towards E-learning is not significant.

**Scope and Limitations of Study:**

The scope of the research study was:

**Area:** All the Medical, Dental and Engineering colleges of Vidarbha region only.

**Population:** All the final year students of Medical, Dental and Engineering colleges of Vidarbha region only.

**Content:** A study of efficacy between the Traditional learning and E-learning attitude of final year students of Medical, Dental and Engineering colleges.

The present study had the following limitations in it.

1. The study was limited to the Universities of Vidarbha and Nashik of Maharashtra State only viz. Sant Gadge Baba Amravati University, Amravati, Rashtra- Sant Tukdoji Maharaj Nagpur University, Nagpur and Maharashtra University of Health Sciences, Nashik.
2. The study was conducted on final year male and female students and lecturers in the colleges of Medical, Dental and Engineering of Vidharbha region only.

3. The study was conducted to measure the attitude by using the attitude scale and opinionnaire for final year students and lecturers of Medical, Dental and Engineering colleges only.

4. The study was conducted only for comparing the efficacy of traditional learning and E-learning and both learning on the academic achievements of the final year male and female students of Medical, Dental and Engineering.

5. No other factors were considered for the present study.

**Research Significance of the Study:**

The present study is significant in the following respects:

1. In designing an attitude scale for measuring the attitude of the final year students of Medical, Dental and Engineering towards traditional learning and E-learning and their efficacy on their academic achievements.

2. In designing an opinionnaire for measuring the attitude of lecturers of Medical, Dental and Engineering towards traditional learning and E-learning.

3. In measuring the academic achievements towards traditional learning and E-learning of the final year students of Medical, Dental and Engineering of Vidarbha region.

4. It is also help in knowing whether the traditional learning or E-learning or both learning methods plays a vital role in providing effective education to the final year students of Medical, Dental and Engineering.
5. Present study is helpful in knowing whether the Universities and Institutions are needed to evaluate whom they train and how.

6. The present study is helpful for the online learners how to achieve updated knowledge in the concerned fields.

7. Present study is also helpful to all areas of education like continuing education, distance education and all faculties of education as a new technology.

Chapter - II

REVIEW OF THE RELATED LITERATURE

Introduction

One of the important steps in the planning of any research study is a careful review of the research journals, books, dissertations, thesis and other sources of information on the problem to be investigated. Therefore, a review of the related literature must precede any well-planned research study.

MURPHY, MICHAEL; MILLER, ALICE (1996)

“Incentives pay off in technological literacy”

(Educational Leadership)

Purpose of the Study :
The Carroll Independent School District in Southlake, Texas, identified a need for teachers and other staff members to be more technologically educated. In response to this need, the district established a performance-based technology competency program; in other words, employees could earn yearly stipends for demonstrating knowledge of technology.

**Conclusion:**

Carroll Independent School District’s first year showed 97% proficiency by teachers and administrators, the second year 82% by the same group, and the third year almost 50% of support staff. The district contends that students are using technology more because their teachers are modeling using it.


“The teachers attitude towards computers in education of young children.“

(In C. Crawford et al. (Eds.), Proceedings of Society for Information Technology and Teacher Education International Conference (SITE) 2000.)

**Abstract:**

The paper presents a research on attitudes towards computers and educational technology in education of young children age from 7 to 11 in few public schools in Subotica (Yugoslavia). The research included over 100 inservice teachers, and was undertaken in September 1999. The research aimed at: - the teacher’s attitudes towards the usage of computers in education of young children, - the teacher’s computers skills, and - the teacher’s attitudes on implementation of computers in the education. The research has shown that very few inservice teachers are actually "computer literates";
the teachers don’t see the possibilities of applying computer technology in their work, but are very interested and willing to advanced in that direction.

FRYDENBERG JIA (2002)

“Quality Standards in e-Learning: A matrix of analysis”

(The International Review of Research in Open and Distance Learning)

Abstract :

Most institutions of postsecondary and higher education are creating or adopting quality statements, standards, and criteria regarding their niche of the “e-Learning enterprise.” In doing so, they have a tendency to reinvent the wheel. This article summarizes current published quality standards in the US, and analyzes and organizes them into a nine-cell matrix.

Conclusions :

1. It concludes with discussion of emerging issues with respect to the nine standards -area and believes the distinction between face-to-face and online will soon merge in both quality standard setting and practice.

2. As pedagogy and learning needs drive educational design, every possible mutation of physical and virtual meetings of minds will be created and be grounded in pedagogical purpose. It is a grand time to be an educator.

CHANG, YU-TAI. (2004)

“The impact of positive feedback and communication on attitudes and self-efficacy beliefs of adult learners in introductory computer courses in Taiwan (China).”

(EdD, Northern Illinois University.)

Purpose of the study :
This study investigated adult student’s learning of computer technologies in the community context in Taiwan. The purpose of this study was to examine the relationship among the multiple demographic variables and the attitudes and self-efficacy beliefs of the student’s learning computer technologies in community adult education in Taiwan.

**Conclusion:**

At the chosen level of significance (.05), five factors were significantly related to computer attitude and self-efficacy: gender, level of education, employment status, hours of computer use, and previous course experience. After the treatment, a significant increase related to computer attitudes and self-efficacy was found in the experimental and control groups. Results also showed a significant interaction effect between attitudes and self-efficacy scores, indicating that the experimental group’s. in addition, a significant, positive relationship was found between final grades and post-test scores.

**COVINGTON, DAVID; PETHERBRIDGE, DONNA; WARREN, SARAH EGAN (2005)**

“Best Practices: A Triangulated Support Approach in Transitioning Faculty to Online Teaching”

(Online Journal of Distance Learning Administration)

**Purpose of the Study:**
This article is in essence a case study of the support provided to staff before and during the large-scale transition of professional writing courses to online delivery at North Carolina State University. In addition to providing detailed information and assessment of the methods used, it develops a model for this kind of support – called the ‘Triangulated Faculty Support Approach’.

**Conclusion:**

The article concludes with the assessment that a successful and smooth process of transition from ‘traditional’ to distance or online methods of teaching requires support from department, faculty peers, and university support staff. This combination allows the successful addressing – in a collaborative manner – of any barriers to online instruction.

**Distinction of the Present Research Study**

In order to know distinction of the research study, the present researcher goes through various websites, digital libraries on internet and literature from different libraries. By studying the review of previous research and related literature the researcher observed that most of the studies related to E-learning technology, various Environment of E-learning, Various tools of E-learning, E-learning software, Students and teachers attitude towards E-learning (ICT) and Traditional learning, E-learning in Higher education, Models of E-learning etc. which helps the researcher to reach near to the specified study.

**Chapter - III**

**RESEARCH METHODOLOGY**

Research Methods are most important in any research process. The most appropriate research methodology has to be selected by the researcher for the
research problem. As the topic for Research is important so also the method for research is important. After careful observation and study of the research problem, researcher under the esteemed guidance of the experts has decided to use “Descriptive Survey Method”. The researcher was studying the attitude of the final year students and lecturers towards Traditional learning and E-learning. The researcher use similar techniques of observation, description and analysis therefore the descriptive research is the appropriate method for the study undertaken for the research by the researcher.

**Population and Sample of the Research Study**

At the beginning researcher collected the names and addresses of all colleges of Medical, Dental and Engineering affiliated to two universities of Vidarbha namely: Sant Gadge Baba Amravati University, Amravati. Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur and University of Health Sciences, Nashik of Maharashtra. This formed the population for the present study.

There are around 7 Medical, 4 Dental and 20 Engineering i.e. total 31 colleges in two Universities of Vidarbha and University of Health Sciences, Nashik of Maharashtra. The researcher for the selection of Medical and Engineering colleges used lottery method, and purposive sampling method for the selection of Dental colleges. Among 31 colleges 12 colleges in three Universities were selected given at least 38.70% weightage to each University mentioned below.

**Table Showing Sample Taken for Research Study**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the College</th>
<th>Total No. of Colleges</th>
<th>Total No. of colleges selected</th>
<th>Total No. Lecturers Selected</th>
<th>Total No. of Stud. selected</th>
<th>Total</th>
</tr>
</thead>
</table>
The researcher selected the above sample of 780 final year male and female students from total 1862 students among the 12 colleges of Medical, Dental and Engineering. i.e. sample of 390 male and 390 female students were selected from various 12 colleges of Medical, Dental and Engineering given 42% weightage to the selected sample from the population of 1862. For the sampling of lecturers the researcher select 5 lecturers from each college by purposive sampling method i.e. total 60 lecturers from the 12 colleges of Medical, Dental and Engineering.

**Construction of Research Tool:**

To construct the perfect questionnaire, researcher has developed two research tools:

1. Questionnaire of Traditional learning and E-learning for Students.
2. Questionnaire of Traditional learning and of E-learning for lecturers.
3. Collection of final examination marks obtained by the final year students of Medical, Dental and Engineering to find the effect of Traditional learning and E-learning on academic achievement.

Out of these two research tools first two tools were opinionnaire and third was list of marks of final examination of the students.
Construction of Attitude Scale of Traditional Learning And E-Learning for Students (ASTES):

The first step in the Likert scale preparation is the collection of number of statements. The first part of the scale was about the information of the students. Second part consist of multiple choice items based on personal computer learning attitude and opinionnaire suggested by likert technique on the major three factors of E-learning i.e. Behavioral factor, Affective factor and Cognitive factor. While framing the items care was taken that they do not carry dual meaning. It was seen that items are not ambiguous.

First of all researcher had studied literature related to traditional learning and E-learning and items were prepared in the form of statement. Each statement was in the form of definitely favorable or definitely unfavorable. Such 65 statements were given to experts for judgment. They discarded 8 statements, as they were found inappropriate and suggest some improvement and linguistic changes in the remaining statement. The statements are then randomly arranged in the scale.

Pilot Study Of ASTES -

The scale with 57 items was then given a trial run among the group of 300 male and female final year students of Medical, Dental and Engineering randomly selected from various colleges from Amravati, Akola, Nagpur, yavatmal and Wardha. The filled-up questionnaire were collected and evaluated. Essential modifications were made and the final scale was ready for final trial run.
These 57 items of the scale were favorably and unfavorably worded and arranged randomly. Favorable items were scored as 5, 4, 3, 2, 1 for SA, A, UD, D, SD; and unfavorable items were scored as 1, 2, 3, 4, 5 for SA, A, UD, D, SD respectively. The total score of the respondent was obtained by adding the score given for each item in the scale. The total score varied from 57 to 285, showing lower attitude to higher attitude towards E-learning.

These papers were then scored and each item was correlated with the total score of the test. An item that did not correlate with the total score of the test was discarded. This internal consistency procedure eliminated ambiguous item and those not of the same type as the rest of the scale.

**Item Selection of ASTES -**

Researcher used Davis method for item selection. It is the basic method of item analysis. The scored papers were arranged in decreasing order of total score. Then 27% of the subject scoring highest and 27% of the subject scoring lowest in the scale were selected to form higher and lower group. 27% of the subjects with the highest score and 27% of the subjects with the lowest score served as criterion group. Discriminating value for each item was determined by calculating 't' on the basis of responses of upper and lower group. Item with C.R. value significant at 0.05 level of significance were finally selected for the scale.

**Final Form Of The ASTES -**

The attitude scale of Traditional learning and E-learning for students (ASTES) in its final form was consisting of 52 highly discriminating favorable and unfavorable items. The list of final three group items is listed below:
Distribution Of ASTES Statements -

This attitude questionnaire of traditional learning and E-learning for students (ASTES) had 29 favorable and 23 unfavorable items i.e. total 52 items in its final form, which can be identified with their serial number as under:

Table Showing Number Favorable and Unfavorable items used in ASTES

<table>
<thead>
<tr>
<th>Statements</th>
<th>Serial Number in the Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable items</td>
<td>8, 9, 10, 11, 13, 14, 16, 17, 18, 20, 21, 22, 25, 28, 31, 33, 36, 38, 39, 40, 44, 45, 46 (only for male), 47, 48, 49, 50, 51, 52</td>
</tr>
<tr>
<td>Unfavorable items</td>
<td>1, 2, 3, 4, 5, 6, 7, 12, 15, 19, 23, 24, 26, 27, 29, 30, 32, 34, 35, 37, 41, 42, 43, 46*</td>
</tr>
<tr>
<td>Note</td>
<td>Item 46* scoring reversed for females only.</td>
</tr>
</tbody>
</table>

Reliability and Validity Of ASTES

The reliability of the questionnaire has been assessed through I) Split Half Method and II) Internal consistency

I) Split Half Method

Following table shows the result of the internal correlations and reliability coefficients of these grouped items by split-half method.
<table>
<thead>
<tr>
<th>Attitudinal Components</th>
<th>No. of Items</th>
<th>Coefficient of Correlation</th>
<th>Spearman-Brown Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural Items</td>
<td>18</td>
<td>0.648</td>
<td>0.787</td>
</tr>
<tr>
<td>Affective Items</td>
<td>14</td>
<td>0.651</td>
<td>0.789</td>
</tr>
<tr>
<td>Cognitive Items</td>
<td>20</td>
<td>0.660</td>
<td>0.795</td>
</tr>
<tr>
<td>Total Items</td>
<td>52</td>
<td>0.881</td>
<td>0.896</td>
</tr>
</tbody>
</table>

From the above table the obtained coefficient of reliability of the whole test on a sample of 300 students is 0.896 and coefficient of correlation on same sample is \( r = 0.811 \) which is very reliable.

**II) Internal consistency**

From the above table, the items used to determine the Behavioural, Affective and Cognitive attitudes of scale have good internal consistency and the coefficient of correlation is 0.648, 0.651 and 0.660 respectively. Also the Internal consistency of the scale was checked by evaluating the coefficient of correlation between the total score and score on each item.

**Validity Of ASTES**

**Content Validity**

Only those items have been included in the scale, which were judged as relevant by the judges. And the discriminative value of each item assessed through the contrasted group technique. Only highly discriminative items were retained.

**Construction of Opinionnaire of Traditional Learning And E-Learning for Lecturers :**
Lecturers attitude opinionnaire of Traditional learning and E-learning consisted of two part viz. personal information format and opinionnaire suggested by Likert technique.

First researcher had studied literature related to traditional learning and E-learning and items are prepared in the form of statement. Each statement was in the form of definitely favorable or definitely unfavorable. Such 55 statements were given to experts for judgment. They discarded 5 statements, as they were found inappropriate and suggest some improvement and linguistic changes in the remaining statement. The statements are then randomly arranged in the scale.

**Pilot Study of Opinionnaire -**

The opinionnaire for lecturers with 55 items was then given a trial run among the group of 18 lecturers of Medical, Dental and Engineering randomly selected from various colleges from Amravati, Nagpur and Wardha. The filled-up opinionnaire were collected and evaluated. Essential modifications were made and the final opinionnaire was ready for final trial run.

These 55 items of the opinionnaire were favorably and unfavourably worded and arranged randomly. Favorable items were scored as 5, 4, 3, 2, 1 for SA, A, UD, D, SD; and unfavorable items were scored as 1, 2, 3, 4, 5 for SA, A, UD, D, SD respectively. The total score of the respondent was obtained by adding the score given for each item in the opinionnaire. The total score varied from 55 to 275, showing lower attitude to higher attitude towards E-learning.

These papers were then scored and each item was correlated with the total score of the test. An item that did not correlate with the total score of the opinionnaire
was discarded. This internal consistency procedure eliminated ambiguous item and those not of the same type as the rest of the opinionnaire.

**Item Selection of Opinionnaire -**

The scored papers were then arranged in decreasing order of total score. Then 27% of the subject scoring highest and 27% of the subject scoring lowest in the opinionnaire were selected to form higher and lower group. 27% of the subjects with the highest score and 27% of the subjects with the lowest score served as criterion group. Discriminating value for each item was determined by calculating ‘t’ on the basis of responses of upper and lower group. Item with C.R. value significant at 0.05 level of significance were finally selected for the opinionnaire.

**Final Form Of Opinionnaire -**

The attitude opinionnaire of traditional learning and E-learning for Lecturers in its final form was consisting of 45 highly discriminating favorable and unfavorable items.

**Distribution Of Opinionnaire Statements -**

This Likert type attitude opinionnaire of traditional learning and E-learning for lecturers had 30 favourable and 15 unfavourable items i.e. total 45 items in its final form, which can be identified with their serial number as under.

**Table Showing Number Favorable and unfavorable items used in the Research Opinionnaire**

<table>
<thead>
<tr>
<th>Statements</th>
<th>Serial Number in the Opinionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable Items</td>
<td>1, 2, 3, 6, 7, 8, 9, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 30, 31, 32, 34, 36, 38, 39, 42, 43, 45</td>
</tr>
</tbody>
</table>
Reliability and Validity Of Opinionnaire

I) Split Half Method

The obtained coefficient of reliability of the whole test on a sample of 18 Lecturers is 0.963 and coefficient of correlation on same sample is ‘r’ = 0.933 which is very reliable.

Validity of Lecturers Questionnaire

Content Validity - Only those items have been included in the scale, which were judged as relevant by the judges.

Collection of Final Examination Marks

To get more reliable information the researcher collect the marks of final examination of final year selected students of Medical, Dental and Engineering to understand the difference between their opinions regarding effectiveness of academic achievement towards E-learning and Traditional learning and actual achievement.

Administration Of The Tests:

For the evaluation and implementation of E-learning at various Medical, Dental, and Engineering colleges were visited. After taking the permission from the Principals of various Medical, Dental, and Engineering colleges the researcher first decide the number of students from the desired class by using stratified random sampling method and then decide time of their free period about at least 45min. to solve both the test schedule from students. The setting arrangement of the selected students was done in

| Unfavorable Items | 4, 5, 10, 11, 12, 16, 27, 28, 29, 33, 35, 37, 40, 41, 44 |
a separate class to get more reliable information. Meanwhile the researcher also
distributes the research questionnaire to the 5 lecturers in each college by using
stratified random sampling method. The tests were filled in the presence of researcher
from the students and lecturers. From the above the researcher found that the response
of male and female students and lecturers of Engineering, Medical and Dental was
good.

To give the final touch to the present study the researcher collects the final year
examination marks of the students of Medical, Dental and Engineering and compute the
effectiveness of academic achievement towards E-learning and Traditional learning.

**Statistical Treatment Given To the Test:**

The researcher selects the following statistical treatment for the selected sample
of students and Lecturers:

1. For the first attitude scale ASTES, CR(Critical Ratio) value, F ratio value,
   Chi square values and Percentages are calculated.

2. For Lecturers opinionnaire of Medical and Dental and Engineering
   percentage and Chi-square values are calculated.

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**Chapter - IV**

**ANALYSIS AND INTERPRETATION OF DATA**

This chapter is developed for Tabulation, Analysis, Interpretation of Data
Collected and the Inferences drawn according to the objective of the study. After the
data was collected the collected data were analysed by using Critical Ratio, percentage, chi-square and F ratio.

**Statistical Analysis and Interpretation for Attitude Scale of Traditional learning and E-learning for Students (ASTES)**

**Table No. 4.1**

<table>
<thead>
<tr>
<th>Response</th>
<th>Obt. Freq.</th>
<th>Percentage</th>
<th>Expt. Freq.</th>
<th>Obt. $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>DF</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>481</td>
<td>61.66</td>
<td>390.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>299</td>
<td>38.33</td>
<td>390.0</td>
<td>42.467</td>
<td>3.841</td>
<td>1</td>
<td>Significant</td>
</tr>
<tr>
<td>Total</td>
<td>780</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table 4.1, 61.66 percent male and female students of Medical, Dental and Engineering have their personal computer and 38.33 percent have not. At the degrees of freedom 1 and 0.05 level of significance the table value of $\chi^2$ is 3.841 and the obtained value of $\chi^2$ is 42.467. As the obtained $\chi^2$ is greater than the table $\chi^2$ value; hence the obtained $\chi^2$ is significant.

Consequently it is revealed that, the percentage of students having personal computer is more than those have not.

[Graph No. 4.1.A: Showing Percentage of Students Having Personal Computer]

**Table No. 4.1.1**
Table of behavioural factor towards E-learning of Male and Female Students of Medical, Dental and Engineering.

<table>
<thead>
<tr>
<th>Stud.</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>64.96</td>
<td>6.992</td>
<td>0.72</td>
<td>0.507</td>
<td>778</td>
<td>1.96</td>
<td>1.42</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Female</td>
<td>64.24</td>
<td>7.183</td>
<td>0.72</td>
<td>0.507</td>
<td>778</td>
<td>1.96</td>
<td>1.42</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

From the above table 4.1.1, the mean of male students of Medical, Dental and Engineering is 64.96 and the mean of female students of Medical, Dental and Engineering is 64.24. Similarly the standard deviation of male and female students of Medical, Dental and Engineering is 6.992 and 7.183 respectively. The difference in mean is 0.72, standard error of difference in mean is 0.507 and the obtained critical ratio is 1.42. As the obtained critical ratio is less than the table critical value i.e. 1.96 at degrees of freedom 778 and 0.05 level of significance; hence the obtained critical ratio is not significant.

Consequently it is revealed that there is no significant difference in the mean of behavioural factor towards E-learning of male and female students of Medical, Dental and Engineering. Thus it can be said that the male and female students possess the same behavioural attitude towards E-learning.

Table No. 4.1.49

Table of behavioral factor and affective factor towards E-learning of Male Students.

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>390</td>
<td>64.96</td>
<td>6.992</td>
<td>12.47</td>
<td>0.484</td>
<td>778</td>
<td>1.96</td>
<td>25.76</td>
<td>Significant</td>
</tr>
<tr>
<td>Male</td>
<td>390</td>
<td>52.49</td>
<td>6.774</td>
<td>12.47</td>
<td>0.484</td>
<td>778</td>
<td>1.96</td>
<td>25.76</td>
<td>Significant</td>
</tr>
</tbody>
</table>
From the above table 4.1.49, the mean of behavioral factor of male students is 64.96 and the mean of affective factor of male students is 52.49. Similarly the standard deviation of behavioral factor of male students and affective factor of male students is 6.992 and 6.774 respectively. The difference in mean is 12.47, standard error of difference in mean is 0.484 and the obtained critical ratio is 25.76. As the obtained critical ratio is greater than the table critical value i.e. 1.96 at degrees of freedom 778 and 0.05 level of significance; hence the obtained critical ratio is significant.

Consequently it is revealed that there is a significant difference in the mean of behavioral factor of male students and affective factor of male students towards E-learning. Thus the behavioral attitude of male students is more than affective attitude of male students towards E-learning.

**Table No. 4.1.61**

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Med. Male</td>
<td>130</td>
<td>86.65</td>
<td>10.177</td>
<td>1.34</td>
<td>1.19</td>
<td>258</td>
<td>1.96</td>
<td>1.12</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Med. Female</td>
<td>130</td>
<td>87.99</td>
<td>9.081</td>
<td>1.34</td>
<td>1.19</td>
<td>258</td>
<td>1.96</td>
<td>1.12</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

From the above table 4.1.61, the mean of Medical male students is 86.65 and the mean of Medical female students is 87.99. Similarly the standard deviation of Medical male and Medical female students is 10.177 and 9.081 respectively. The difference in mean is 1.34, standard error of difference in mean is 1.19 and the obtained critical ratio is 1.12. As the obtained critical ratio is less than the table critical value i.e. 1.96 at degrees of freedom 258 and 0.05 level of significance; hence the obtained critical ratio is not significant.
Consequently it is revealed that there is no significant difference in the mean of traditional learning of Medical male and Medical female students. Thus the Medical male and Medical female students possess the same attitude towards Traditional learning.

Table No. 4.1.64

Table of Medical Male and Dental Male Students towards Traditional learning.

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Med. Male</td>
<td>130</td>
<td>86.65</td>
<td>10.177</td>
<td>0.68</td>
<td>1.00</td>
<td>258</td>
<td>1.96</td>
<td>0.67</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Dental Male</td>
<td>130</td>
<td>85.97</td>
<td>8.964</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table 4.1.64, the mean of Medical male students is 86.65 and the mean of Dental male students is 85.97. Similarly the standard deviation of Medical male and Dental male students is 10.177 and 8.964 respectively. The difference in mean is 0.68, standard error of difference in mean is 1.00 and the obtained critical ratio is 0.67. As the obtained critical ratio is less than the table critical value i.e. 1.96 at degrees of freedom 258 and 0.05 level of significance; hence the obtained critical ratio is not significant.

Consequently it is revealed that there is no significant difference in the mean of traditional learning of Medical male and Dental male students. Thus the Medical male and Dental male students possess the same attitude towards Traditional learning.

Table No. 4.1.76

Table of Traditional learning and E-learning of Medical Male Students.

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Stud.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DM</th>
<th>SEM</th>
<th>DF</th>
<th>Table Value</th>
<th>OBT. CR</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
</table>
From the above table 4.1.76, the mean of Medical male students towards traditional learning is 86.65 and the mean of Medical male students towards E-learning is 101.24. Similarly the standard deviation of Medical male students towards traditional and E-learning is 10.177 and 9.707 respectively. The difference in mean is 14.59, standard error of difference in mean is 1.23 and the obtained critical ratio is 11.86. As the obtained critical ratio is greater than the table critical value i.e. 1.96 at degrees of freedom 258 and 0.05 level of significance; hence the obtained critical ratio is significant.

Consequently it is revealed that there is a significant difference in the mean of traditional learning and E-learning of Medical male students. Thus the attitude of Medical male students towards E-learning is more than Medical male students towards Traditional learning.

Table No. 4.1.91

Table of Effect of Traditional learning and Both Learning method on Academic Achievement of Medical, Dental and Engineering Students.
From the above table 4.1.91, the mean of traditional learning method is 1010.11 and the mean of both learning method is 1074.78. Similarly the standard deviation of traditional learning and both learning method is 117.64 and 93.54 respectively. The difference in mean is 64.67, standard error of difference in mean is 10.22 and the obtained critical ratio is 6.33. As the obtained critical ratio is greater than the table critical value i.e. 1.96 at degrees of freedom 442 and 0.05 level of significance; hence the obtained critical ratio is significant.

Consequently it is revealed that there is a significant difference in the mean of traditional learning and both learning methods on academic achievement of Medical, Dental and Engineering students. Thus the both learning (Traditional +E-learning) method is more effective than only Traditional learning method on Medical, Dental and Engineering students to improve their academic achievement.

**Statistical Analysis and Interpretation of Lecturers Opinionnaire**

**Table No. 4.2.1**

**Q. 1. How many hours per week do you spend on the computers for working?**

<table>
<thead>
<tr>
<th>Response</th>
<th>Obt. Freq.</th>
<th>Percentage</th>
<th>Expt. Freq.</th>
<th>Obt. $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>DF</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Than 5h</td>
<td>34</td>
<td>56.66</td>
<td>12.0</td>
<td></td>
<td>55.33</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>5-10h</td>
<td>12</td>
<td>20</td>
<td>12.0</td>
<td></td>
<td>9.49</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>10-20h</td>
<td>8</td>
<td>13.35</td>
<td>12.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Than 20h</td>
<td>4</td>
<td>6.66</td>
<td>12.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Don’t Use</td>
<td>2</td>
<td>3.33</td>
<td>12.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table 4.2.1, 56.66 percent lecturers of Medical, Dental and Engineering spend less than 5h/week on computer for their work. 20 percent lecturers
spend 5h to 10h/week on computer for their work. 13.35 percent lecturers spend 10h to 20h/week on computer for their work. Only 6.66 percent lecturers spend more than 20h/week on computer for their work and the percentages who don’t use computers for work is only 3.33 percent. At the degrees of freedom 4 and 0.05 level of significance the table value of $\chi^2$ is 9.49 and the obtained value of $\chi^2$ is 55.33. As the obtained $\chi^2$ is greater than the table $\chi^2$ value; hence the obtained $\chi^2$ is significant.

Consequently it is revealed that, the percentage of lecturers who spend less than 5hr/week on computers is more than other responses.

Graph No. 4.2.1.A : Showing Percentage of Lecturers Spending Time on Computers for Work.

Table No. 4.2.7

I use separate presentations and demonstrations as electronic based learning material in the class.

<table>
<thead>
<tr>
<th>Response</th>
<th>Obt. Freq.</th>
<th>Percentage</th>
<th>Expt. Freq.</th>
<th>Obt. $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>DF</th>
<th>Significance at 0.05 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>1</td>
<td>1.66</td>
<td>12.0</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>6.66</td>
<td>12.0</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>Undecided</td>
<td>3</td>
<td>5.00</td>
<td>12.0</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>Disagree</td>
<td>34</td>
<td>56.66</td>
<td>12.0</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>18</td>
<td>30.02</td>
<td>12.0</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td>60.00</td>
<td>65.50</td>
<td>9.49</td>
<td>4</td>
<td>Significant</td>
</tr>
</tbody>
</table>
From the above table, at the degrees of freedom 4 and 0.05 level of significance the table value of $\chi^2$ is 9.49 and the obtained value of $\chi^2$ is 65.50. As the obtained $\chi^2$ is greater than table $\chi^2$ value; hence the obtained $\chi^2$ is significant.

Consequently it is revealed that, there is a significant difference in the class separate presentations and demonstrations use as electronic based learning material by lecturers.

5.2 Conclusions

From the statistical analysis and interpretation of data collected the following are the conclusions:

1. It is found that the male and female final year students of Medical, Dental and Engineering possess the same behavioural attitude towards E-learning.

2. It is also found that the Engineering female and Medical male, Engineering female and Medical female, Medical male and female, Dental male and female students of final year possess the same behavioural attitude towards E-learning. But the Engineering male and female, Engineering male and Medical male, Engineering male and Medical female, Engineering male and Dental male, Engineering male and Dental female, Engineering female and Dental female, Engineering female and Dental male, Medical male and Dental male, Medical female and Dental female, Medical male and Dental female, Medical female and Dental male students of final year towards behavioural attitude of E-learning differ significantly.
3. It is found that the male and female final year students of Medical, Dental and Engineering possess the same affective attitude towards E-learning.

4. It is also found that the Medical male and Medical female, Medical male and Dental male, Medical female and Dental female, Medical male and Dental female, Medical female and Dental male, Dental male and Dental female students of final year possess the same affective attitude towards E-learning. But the Engineering male and female, Engineering male and Medical male, Engineering male and Medical female, Engineering female and Medical male, Engineering female and Medical female, Engineering male and Dental male, Engineering male and Dental female, Engineering female and Dental female, Engineering female and Dental male students of final year towards affective attitude of E-learning differ significantly.

5. It is found that the male and female final year students of Medical, Dental and Engineering possess the same cognitive attitude towards E-learning.

6. It is also found that the Engineering female and Medical male, Engineering female and Medical female, Medical male and Medical female, Medical male and Dental male, Medical male and Dental female, Dental male and Dental female students of final year possess the same cognitive attitude towards E-learning. But the Engineering male and female, Engineering male and Medical male, Engineering male and Medical female, Engineering male and Dental male, Engineering male and Dental female, Engineering female and Dental female, Engineering female and Dental male, Medical female and Dental female, Medical
female and Dental male students of final year towards cognitive attitude of E-
learning differ significantly.

7. It is found that the attitude of male and female final year students towards
behavioural factor and affective factor of E-learning in the colleges of Medical,
Dental and Engineering differ significantly.

8. It is found that the attitude of male and female final year students towards
behavioural factor and cognitive factor of E-learning in the colleges of Medical,
Dental and Engineering differ significantly.

9. It is found that the attitude of male and female final year students towards
affective factor and cognitive factor of E-learning in the colleges of Medical,
Dental and Engineering differ significantly.

10. It is found that the male and female final year students possess the same attitude
towards Traditional learning in the colleges of Medical.

11. It is found that the male and female final year students possess the same attitude
towards Traditional learning in the colleges of Dental.

12. It is found that the male and female final year students possess the same attitude
towards Traditional learning in the colleges of Engineering.

13. It is found that the Medical male and Dental male, Medical male and Dental
female, Medical female and Dental male students of final year possess the same
attitude towards Traditional learning. But the attitude of Medical female and
Dental female students of final year towards Traditional learning in the colleges
of Medical and Dental differ significantly.
14. It is found that the attitude of Medical male and Engineering male, Medical female and Engineering male, Medical male and Engineering female students of final year towards Traditional learning differ significantly. But the Medical female and Engineering female students of final year possess the same attitude towards Traditional learning in the colleges of Medical and Engineering.

15. It is found that the attitude of Engineering male and Dental male, Engineering male and Dental female, Engineering female and Dental female, Engineering female and Dental male students of final year towards Traditional learning in the colleges of Medical and Engineering differ significantly.

16. It is found that the attitude of male and female final year students of Medical colleges towards Traditional learning and E-learning differ significantly.

17. It is found that the attitude of male and female final year students of Dental colleges towards Traditional learning and E-learning differ significantly.

18. It is found that the attitude of male and female final year students of Engineering colleges towards Traditional learning and E-learning differ significantly.

19. It is found that attitude of male and female students towards Traditional learning and E-learning in the colleges of Medical, Dental and Engineering differ significantly.

20. It is found that the effect of Traditional learning and both learning on academic achievement of final year students in the colleges of Medical, Dental and Engineering differ significantly.
21. It is found that the effect of E-learning and both learning on academic achievement of final year students in the colleges of Medical, Dental and Engineering differ significantly.

22. It is found that the effect of Traditional learning and E-learning on academic achievement of final year students in the colleges of Medical, Dental and Engineering differ significantly.

23. It is found that the effect of Traditional learning, E-learning and Both learning on academic achievement of final year students in the colleges of Medical, Dental and Engineering differ significantly.

24. It is found that the attitude of lecturers towards E-learning in the colleges of Medical, Dental and Engineering is favorable.

5.3 Suggestions

From the statistical analysis and interpretation of data collected and from the conclusions the following are the suggestions:

5.3.1 Suggestions for Students

1. The students should not only be self-disciplined, self-motivated to learn, willingness to ask help, mature, experienced and self-directed but work on Internet to become an online successful learner.

2. To improve the quality of learning the students must devote usually 10-15 hours/week for E-learning.

3. As E-learning is very essential, the students must know about the basics of virtual learning environment (PC, internet connection, software).
4. Every student must create his own content, enhance it using multimedia, append to it as and when information changes, share it with others, and make effective use of the same for self-learning as well as to teach others.

5. To achieve the better academic result the students must update their knowledge time to time and try to do their maximum study related work with the help of E-learning.

6. The students should prepare and form an E-learners club to foster greater student interaction, collaboration and greater student/instructor contact.

### 5.3.2 Suggestions for Lecturer

1. The lecturer must have the positive attitude towards E-learning, technology related to E-learning.

2. The lecturer should know how to use the Internet, how to get connected, how to learn online (study habits, time management etc.), how to use course management system and familiarity with software- word processor, spreadsheet, communications tools etc. for effective of classroom teaching.

3. The lecturer must teach with the help of E-learning technology, establish understanding with students to make them at ease and encourage them to participate to improve the student’s performance.

4. The lecturer must be a course facilitator and should be trained as ‘trouble shooter’ and be able to solve elementary hardware and software problems.
5. The lecturers should be developed own E-learning material for effective teaching and post the lecture notes, handouts, and reference material to the students on the Internet for supporting the classroom teaching.

6. The lecturer should update their own knowledge by accessing detailed information regarding the subject. It will also help to do the research work.

7. The lecturer should be aware of students need and involvement level, motivate them for delivering their homework, assignments and class seminars by using E-learning techniques, attempts to involve students into discussions, organized schedule and provide resources for students in need of additional learning.

5.3.3 Suggestions for Educational Institution /University /Government

1. Universities need to collaborate both cost effective and efficient E-learning and traditional learning in every higher educational Institution.

2. Higher Education institutions need to consider the implications of E-learning and implement the new E-learning Strategies in the colleges.

3. The role of Higher Institution/University as a good facilitator is to provide good virtual learning environment necessary for academic success in each and every school/college compulsorily.

4. As Traditional learning and E-learning goes hand in hand academic Colleges of all universities conduct educational programmes (e.g. workshops, seminars) every year. These programmes can be also made available in an E-learning environment to improve the lecturers /students skill.
5. The Government should provide funds to the development of the ICT sector to create virtual learning environment in every university and college level.

6. Government should make E-learning as a widely accepted method of training and education within schools, colleges and organizations.

7. Government/Universities need a major marketing and awareness effort as E-learning can raise the level of education, literacy and economic development.

5.4 **Directions for Future Research Study**

The Researcher suggests the following research topics, which may be undertaken by the future research scholar.

1) A critical study of open universities and different institute that foster E-Education.

2) A comparative study of Traditional learning and E-learning of granted and non granted vocational colleges in Maharashtra.

3) A comparative study of Traditional learning and E-learning at post graduate level of different states.

4) Development of E-learning skills among the students of Vocational courses – An experimental study.

5) Development of E-learning skills among the students of Professional courses – An experimental study.

6) Development of E-learning skills among the students of Technical courses – An experimental study.
7) A study of effect of E-learning software on the attitude of students of vocational courses.

8) A comparative study of Traditional learning and E-learning of Art, Commerce and Science post graduate students.

9) A study of effect of E-learning software on the academic achievement of post graduate students by developing E-learning software- An experimental study.

10) A study of the relationship between teachers and students regarding the online Education.