

**A COMPARATIVE STUDY OF THE OFFLINE MODE AND ONLINE MODE OF
TEACHING AS PERCEIVED BY THE SCHOOL
TEACHERS.**

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**A
DISSERTATION
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2020-22**

CERTIFICATE

This is to certify that the project entitled “**A COMPARATIVE STUDY OF THE OFFLINE MODE AND ONLINE MODE OF TEACHING AS PERCEIVED BY THE SCHOOL TEACHERS**” has been prepared by Mrs. Deepty Acharya in partial fulfillment of the requirements for the master’s degree in education of university of Mumbai. It embodies material collected and analyzed by the candidate under my guidance. It is hereby approved as indicating the proficiency of this candidate.

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DECLARATION OF THE CANDIDATE

As required by university ordinance 770, I wish to state that the work embodied in this dissertation titled “**A COMPARATIVE STUDY OF THE OFFLINE MODE AND ONLINE MODE OF TEACHING AS PERCEIVED BY THE SCHOOL TEACHERS**” forms my own contribution to the research work carried out under the guidance of Dr Sally Enos, Principal at Mahatma Education society’s Pillai college of Education and research, New Panvel (W). This work has not been submitted for any other degree of this or any other university. Whenever references have been made to previous works of others, it has been clearly as such included in the Bibliography.

Date :

Place :

Signature of the candidate

(Mrs. Deepty Acharya)

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Researcher

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LIST OF ABBREVIATIONS

S.No.	Abbreviation	Terminology
1.	M.D.	Mean difference
2.	S.E.D	Standard Error Difference
3.	S.D.	Standard Deviation
4.	l.o.s.	Level of Significance
5.	N	Total number of items in sample
6.	MS	Mean Square
7.	df	Degree of freedom
8.	S*	Significant at 0.05 level of significance
9.	S**	Significant at 0.01 level of significance
10.	NS	Not Significant
11.	ANOVA	Analysis of variance

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CHAPTER 1

INTRODUCTION

1.1 Introduction:

“Education is evolving due to the impact of the internet. We cannot teach our students in the same manner in which we were taught. Change is necessary to engage students not in the curriculum we are responsible for teaching.”

April chamberlain

Education is the only mode that helps in getting a good profession, it also makes us a responsible citizen of society and develops morality in us. Education can be divided into different stages i.e., primary, secondary, and higher education. The broad purpose of education is to prepare a learner to perform effectively in society and contribute as a self-reliant member. Schools are the initial centers of learning. Teaching is one of the instruments of education and is a special function to impart understanding and skill.

The main function of teaching is to make learning effective. The learning process would get completed through teaching. So, teaching and learning are very closely related. Teaching is a process in which one individual teaches or instruct another individual. Teaching can be summarized as the act of imparting instructions to the learners in the classroom situation.

Teaching methods are the broader techniques used to help students achieve learning outcomes, while activities are the different ways of implementing these methods. Teaching methods help students, master the content of the course, learn how to apply the content in particular contexts.

Teacher should identify which teaching methods will properly support a particular learning outcome. Its effectiveness depends on this alignment. To make the most appropriate choice, teacher should consider learning outcomes, student needs and the learning environment. Choosing the appropriate teaching method brings instruction to life while encouraging students to actively engage with content and develop their knowledge and skills.

‘Learning is a lifelong process’, and indeed it is. It is just that the methods through which one teaches and one learns have undergone a lot of changes. With the escalation of the digital era, everything and everyone turned to computers and technology with all the papers and their prints turning into digital ink on the screen. The traditional classes of blackboard and chalk are officially transforming into, in fact, are already converted into online classes for kids or adult students. Nowadays, new technologies being so easily accessible to everyone and with young generations used to use the internet and the virtual world every day, having more visual and interactive study materials is becoming way more engaging than sticking to the old-fashioned school book.

Teaching methods are very important and can enhance teaching effectiveness. However, no method can be recommended for every context. Different methods are appropriate for different contexts. Furthermore, teaching methods are only one component of the many that interact and are entangled in a teaching event. Amongst others are the commitment of the teacher; the physical and psychological conditions of the teaching space; the commitment of the learners; support of caregivers and parents; the relationship between the curriculum and the interests and needs of the students. Finally, it must always be remembered that learning is a process or becoming.

All these years’ teachers used to have classroom sessions which had face to face interaction with the student. However, in last 2 years something unprecedented happened and pandemic created a drastic change in the mode of teaching where teachers were having to resort to conduct classes through online with the help of various computer

application such Google meet, Zoom, Microsoft teams.

(Priyadarshani, 2021)²²The lockdown affected education on several fronts. Students had to stop going to school. Globally, universities and schools started to adopt online teaching mode. In a resource-limited environment such as lack of internet connectivity and lack of access to existing institutional online learning portals and finally lack of proper devices it was really difficult task to manage the online mode of studies as Indian government has decided to conduct online classes.

In an online mode of studies, the role played by teachers and students is significant because their expectations and attitudes are crucial for learning and its motivation. In the crux, it is the acceptance of students and teacher that continues to enjoy the advantages of online classes. Advancement in technology is changing the face of education leaving us with no option than to change our attitude towards new teaching methods.

There is face-to-face interaction in the case of offline classes, especially because teaching is synchronous. There is active communication between students and teachers which allows for lively discussions and debates between them. Moreover, it allows students to immediately address their doubts and receive quick feedback.

Online education is purely theoretical and takes place entirely online. This scarcely allows students to take part in the practical aspects of learning which is an equally important part of education. Subjects like chemistry, physics, biology, art and sports require students to be physically present and conduct live experiments or actively participate in the activity.

Offline classes provide a stimulating environment that combines both theoretical and practical aspects of learning, unlike online classes. This contributes to the overall cognitive and skill development of the students. Practical learning allows you to learn and quickly adapt to the daily challenges and scenarios and allows you to get a better understanding of lessons.

This study is an attempt to understand the perception of secondary school teachers towards the online teaching mode and offline teaching mode. This is an effort to identify the positive and negative factors of online teaching in comparison of offline teaching and consider the challenges and concerns that teachers face when offering online teaching.

1.2 Conceptual framework:

We have entered the age of digital revolution but a large population of Indian students still solely relies on typical blackboard teaching. As there was a sudden lockdown, due to the worldwide Corona virus pandemic, one of the sectors that has come on back foot is education.

To minimize the loss in studies, government circulated guidelines to practice online teaching and complete the left-out syllabus using digital platform without establishing a basic blueprint due to closure of school.

(Damayanti, 2020)¹⁶Online Teaching mode incorporates the use of internet to deliver study material to students in the form of video tutorials, presentations & texts. The primary objective is to dispense knowledge to students and enable them to learn at their own pace and convenience.

On the other hand, offline classes provide students with a practical learning environment within the walls of a physical classroom. It allows students to closely interact with their teachers as well as participate actively in live discussions and debates. Students can also participate in recreational activities like art and physical education which contributes to the overall mental and physical development of the student. When it comes to online classes, teachers can easily educate their students via virtual classrooms. Students can easily access learning materials from anywhere if they have proper access to an internet connection. Online classes provide teachers with a number of online support learning tools including videos, audios, animations, virtual whiteboards, virtual conference rooms and live chats with the students.

While online classes can be taken through video conferencing, assignments can be submitted by students by using Google platforms. Most of these platforms are free to operate, making it easy for both students and teachers.

There are many benefits of online mode of teaching like the ease of home, flexibility, impartiality and without time constraints. When one study online, all the documentation is saved in the drive and hence the students can mainly focus on learning instead of taking care of assignment copies etc.

Online teaching allows ones to carry on study even along with job and Massive Open Online Courses can be supplemented along with classroom teaching for dispensing knowledge in a better way amongst the students.

The most common complaint about online teaching mode is that it lacks face-to-face interaction and spontaneous exchange of ideas that one can grab with classmates and a teacher in real time.

Offline teaching refers to the conventional classroom teaching where both teachers and students need to be physically present. The personal interaction of teacher is far better than online mode. The tests and exams are normally taken on physical paper sheets and there are virtually no chances of copying. In offline learning being face to face allows more participation and activity based on traditional forms of education.

Offline mode of teaching requires students to develop a sense of discipline and responsibility. Students can gain an understanding of the subject content and make connections between them in real time. If a student doesn't understand what is being taught, they can immediately gain clarity by asking their teacher. Also, teacher can understand the body language of the students and can anticipate if the teaching topic is being understood by the student or not.

Offline teaching also provides opportunity to have interactions in the class through which students learn how to behave socially and also understand how to handle responsibility. Online teaching is totally technology dependent. Further, one requires only

a connecting device like smart mobile phones, tabs or a desktop/laptop and a decent internet connection for completing the online tasks. If either of the two i.e. device or connection doesn't work properly, it becomes difficult to give time bound assignments.

(Bandgar, 2021)¹⁴The main difference between online and offline mode is location and challenges and opportunity presented by location. With offline learning, participants are required to travel to the training location, typically a lecture hall, college or classroom. This at one hand takes lot of effort, time and resources for reaching up to classroom. With online learning, on the other hand, the training can be conducted from practically anywhere in the world. Participants simply need to log on to the internet from their home, work or even their local coffee shop.

Another difference is the flexibility offered. Online learning usually has a more flexible timescale. As a trainer, you can offer your support via email or through an online chat system. With offline learning, it is typically carried out between office hours and doesn't offer as much flexibility to the learner or the trainer. Besides these two differences, the benefits of learning online or offline are practically the same. Online qualifications are just as internationally recognized as offline ones and the standards of learning are also identical.

Although online teaching mode has become the preferred method for youngest teachers, it's important not to dismiss the benefits of offline teaching mode. With online teaching mode, teacher and the students benefit from a more casual, flexible approach. Being unrestricted regarding location and times. This means every student can benefit from this mode.

With offline teaching mode, it's easier to ensure students are paying attention to the teaching. Some teachers also find it easier to retain the knowledge and skills they've learnt through offline teaching mode than they do with online teaching mode. As there are benefits to both learning options, it makes sense to offer a combined online and offline teaching approach as a teacher.

The perception of teacher about online mode of teaching and offline mode of teaching is different with different aspect. Some teachers who are young and technically trained are preferring online mode of teaching because they can adopt this environment very easily. While those teachers who you are used to offline mode of teaching, are facing difficulty in handling the online mode of teaching.

The aim of the study is to know the perception of secondary school teachers about online mode of teaching and offline mode of teaching with different dimension such as classroom teaching, classroom interaction, content delivery and student assessment.

1.3 Rationale of the Study:

Lockdowns were observed in almost all the nations across the world due to ongoing pandemic. This has caused change in education imparting from offline mode of teaching to online mode of teaching. This study tried to understand the comfortableness of schoolteachers in offline teaching and online teaching mode.

A literature review of research on effective online teaching strategies revealed several recurrent themes of collaborative activities such as instructor presence using a variety of instructional methods and found that several factors are important to create a sense of social presence and caring. They examined presence and supported common factors. Online classes are always challenged by technical issues. Access to proper electronic equipment such as webcams, microphones, headphones, and computers along with a proper internet connection is mandatory requirement for online classes. Additionally, technical issues such as slow internet connection or lack of availability of proper technical infrastructure may interfere with seamless learning. Students may face difficulty in attending live lectures or downloading videos or online notes.

Offline classes are rarely threatened by technical issues. Students and teachers are not required to be exceptionally tech-savvy and since most learning occurs within the physical classroom, technical issues are not a major issue except for any lessons that

require presentations or computers. Contrary to the popular belief that there is hardly any interaction between students and teachers in online education, there is an ample scope of interaction for students and teachers over the online platforms. Online classes allow students to get in touch with their teachers immaterial to the time or location. Online classrooms also allow two-way communication which significantly influences learning. Student-teacher interaction in online classes may be both synchronous and asynchronous. The purpose of the study was to provide that the teachers need to observe the change in their roles. Teachers ought to invest every effort into improving student mindset. some aspects need to be taken care of to be successfully teaching in Schools and other educational institutions are required to provide exemplary teaching and guidance from both students and teachers for the use of online classes, which aims to enhance their convenience.

1.4 Statement of the problem:

“A comparative study of Offline teaching mode and Online teaching mode as perceived by school teachers.”

1.5 Variables of the study:

There are two independent variables in my study. One is offline teaching mode and other is online teaching mode.

1.6 Definition:

Offline teaching mode: Offline teaching system offers formal teaching through classroom based studies where lessons are taught in a sequential manner along with periodic assessments by qualified teachers.

Online teaching mode: Online teaching is defined as teaching facilitated by the use of digital tools and content that involves some form of interactivity, which may include online interaction between the learner and their teacher or peers.

1.6.1 Conceptual definitions:

In the mode of teachings some parameters are as follows:

Classroom preparation: refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive, on task, and academically productive during a class.

Content delivery: Content delivery is the most basic and familiar way to teach new concepts through lectures or presentations in a classroom style environment. It is about communicating ideas, frameworks, models and other information in a way that is understandable and digestible.

Classroom Interaction: classroom interactions a practice that enhances the development of the two very important language skills which are speaking and listening among the learners. This device helps the learner to be competent enough to think critically and share their views among their peers.

Student assessment: Assessment is the process of gathering information on what students know based on their educational experience. The results are typically used to identify areas where improvement is needed and ensure that the course content meets learning needs.

In education, the term assessment refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students.

1.6.2 Operational definition:

Offline teaching mode : The Secondary School teachers are the sender of the source; the education material is the information, and the Secondary Students are receiver of the information. In term of the delivery medium the educator can deliver the message via “chalk and talk” method.

Online teaching mode : In Online teaching mode Secondary school teachers are educating Secondary students on virtual platforms. This type of teaching involves live classes, video conferencing, webinars, and other online tools.

Classroom preparation:

Offline teaching mode in which teachers are the controller of the class where they teach and take the complete responsibility of the learning environment. All the duties and powers are vested in the teacher and they, being the lecturer in the class, play the role of an instructor for the students and the decision maker for taking the decision of what to teach and how to teach. When teaching online, educators must push themselves to deliver their classes in the simplest and effective manner.

Content delivery:

In Offline mode of teaching methods, classrooms are teacher centric. Teachers are the main source of knowledge in the traditional method of teaching. They take the responsibility of knowledge dispensers, not the facilitators.

Online of teaching mode teachers must focus on using a combination of audio and video lectures, discussions, hands-on exercises, etc., to engage students. Your online classroom must be an active learning environment that uses a blend of interactive teaching methods.

Classroom Interaction:

Establishing a personal connection with the students will help teachers to provide a positive learning experience. Rather than just delivering content in a monotonous way, be a storyteller. Teachers ask students to recite and memorize the content of study and what they teach in the classroom and students one by one recite the lesson when their turn comes. Then students are asked to memorize the lesson and based on this recitation, teachers take assignment, written test or oral test. Establishing clear communication with the students is the first step towards successful online teaching mode. During live online

classes, teacher must maintain a setup such as a good microphone, enable camera use, and reduce background noise.

Student assessment:

Offline assessments ensure that all students have the same test experience, regardless of whether they are in an area with high Internet access and can take their exam online or in an area with low Internet connectivity and must take their exam offline. Sonika Srivastava said, "In my 15 years of teaching experience, I can say that offline assessments work well in India. This is because most of our rural population lack an appropriate device to appear for online exams. It has been observed that not only students but also teachers are not tech-savvy. They struggle with online assessments." Technology is not always reliable. If a system fails, information may be lost. Teachers may require technical assistance to construct paper in some instances. Setting up an electronic evaluation system in a learning institution or corporate training environment can cost thousands. Essay writing, analysis and cognitive thinking examination doesn't work appropriately in an online testing.

1.7 Research question:

1. What is the perception of teachers at secondary school with reference to Online and Offline teaching mode?
2. Will there be any difference between online teaching mode and offline teaching mode as perceived by secondary school teachers?
3. Will there be any difference in the delivery of content in online mode vs offline mode of teaching?
4. Will there be any difference in the classroom preparation for teachers in online mode vs offline mode of teaching?
5. Will there be any difference in the interaction of students in online mode of teaching vs offline mode of teaching?

6. Will there be any difference in the assessments of students in online mode of teaching vs offline mode of teaching?

1.8 Aim of the study:

To compare the offline mode of teaching and online mode of teaching as perceived by the secondary school teachers.

1.9 Objectives of the study:

1. To compare the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers.
2. To compare the Offline teaching mode and Online teaching mode among the secondary school teachers with reference to gender.
3. To compare the Offline teaching mode and Online teaching mode among the secondary school teachers with reference to affiliated boards.
4. To compare the Offline mode of teaching and Online mode of teaching among secondary school teachers with reference to teaching subjects.
5. To compare the Offline mode of teaching and Online mode of teaching among secondary school teachers with reference to experience.
6. To compare the Offline teaching mode and Online teaching mode among the secondary school teachers with reference to classroom preparation.
7. To compare the Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of on gender.
8. To compare the Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of on boards.
9. To compare the Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of on subjects.
10. To compare the Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of experience.

11. To compare Offline teaching mode and Online teaching mode among the secondary school teachers with reference to content delivery.
12. To compare the Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of gender.
13. To compare the Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of affiliated boards.
14. To compare the Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of on teaching subjects.
15. To compare the Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of experience
16. To compare the Offline mode and Online among the secondary school teacher with reference to classroom interaction.
17. To compare the Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of gender.
18. To compare the Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of affiliated boards.
19. To compare the Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of teaching subjects.
20. To compare the Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of experience.
21. To compare the Offline mode and Online mode among the secondary school teacher with reference to student's assessment
22. To compare the Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of gender.
23. To compare the Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of affiliated boards.
24. To compare the Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of teaching subjects.

25. To compare the Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers based on experience.

1.10 Hypotheses of the study:

1. There is no significant difference between the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers.
2. There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teachers with reference to gender.
3. There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teachers with reference to affiliated boards.
4. There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to teaching subjects.
5. There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to experience.
6. There is no significant difference between Offline mode and Online mode among the secondary school teachers with reference to classroom preparation.
7. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of on gender.
8. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of boards.
9. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation among secondary school teachers on the basis of subjects.
10. There is no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation among secondary school teachers on the basis of experience.

11. There is no significant difference between Offline mode and Online mode among the secondary school teachers with reference to content delivery.
12. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of gender.
13. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of affiliated boards.
14. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of teaching subjects.
15. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery among secondary school teachers on the basis of experience
16. There is no significant difference between Offline mode and Online among the secondary school teachers with reference to classroom interaction.
17. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of gender.
18. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of affiliated boards.
19. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction among secondary school teachers on the basis of teaching subjects.
20. There is no significant difference between Offline teaching mode and on Online teaching mode of classroom interaction among secondary school teachers on the basis of experience.

21. There is no significant difference between Offline mode and Online mode among the secondary school teachers with reference to student's assessment
22. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of gender.
23. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of affiliated boards.
24. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment among secondary school teachers on the basis of teaching subjects.
25. There is no significant difference between Offline teaching mode and on Online teaching mode of Student Assessment among secondary school teachers on the basis of experience.

1.11 Scope and delimitation of the Study:

The study provides the perception of secondary school teachers based on gender various boards, teaching subjects, teaching experience with reference to preparation for the class, deliver the content, class interaction and student assessment about the online mode of teaching and offline mode of teaching.

The scope of study was delimited to the following due time constraint and limited resources to the investigator.

Delimitations :

1. The study confined to the teachers of secondary school only
2. The data was collected through questionnaire.
3. The teachers from rural areas will not be considered.
4. Teachers from English Medium School will be considered
5. The teachers from Navi Mumbai areas only taken in the research.
6. Only CBSE, ICSE, SSC School board are taken for research.

1.11 Significance of the Study :

The advent of technology has brought many changes in the field of communication, information technology, service education etc. The education is also witnessing major changes in the field. The teaching methodology is slowly making a shift from regular face to face education to online education.

1. Study will play an important role in understanding the perception of different schoolteachers towards of online and offline mode of teaching.
2. The result of the study will be helpful to understand effectiveness of the mode of teaching.
3. This survey has focused on finding out about teacher and teacher educator needs, it would also be useful to collate the beneficial lessons learned by teachers during the process of adapting to working under physical distancing measures and share therefore future professional development.
4. This study Support for teacher in the basics of remote teaching and remote training pedagogy and practices will be developed.

Many teachers have accepted this Offline and Online mode of integration. Reformed has played positive role in promoting. The true knowledge gained in this kind of practice is helpful for teachers to study the basic laws of scientific cognition, and to actively think and explore teaching methods that more suitable for themselves and their majors and therefore more enlightening. We believe that the future education model will better meet the needs of teachers and create a new Era of education.

1.13 Conclusion:

Information and communication technologies play a very useful and effective role in education and can fulfill the needs of the present time. It is difficult for a developing

country to educate its masses merely through the formal education system based on offline mode of teaching. Hence, online teaching has potential to meet the challenges of the present time so that people do their role for the development of the education. Effective and appropriate use may help to improve teaching but it is impossible to replace the traditional classroom. Teachers were inspired by this live streaming lesson. They generally believe that Online teaching was form of teaching that worth promoting.

The study also proved that online mode of teaching has a more significant role to play in the future, but it cannot be a replacement to offline mode of teaching. A complete transition to online mode of teaching is quite tricky. However, we cannot ignore the benefits derived from online mode of teaching. As such, there is a need to understand the obstacles that come in the way of accepting online teaching and take corrective measures to overcome it.

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CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Introduction:

Research takes advantage of knowledge which has gathered in past because of constant hard work of researcher. The aim of any literature reviews is to summarize and synthesize the arguments and ideas of existing knowledge in a particular field without adding any new contributions. Being built on existing knowledge they help the researcher to even turn the wheels of the topic of research. As per the common belief, literature reviews are only a summary of the sources related to the research. And many authors of scientific manuscripts believe that they are only surveys of what are the research are done on the chosen topic. But on the contrary, it uses published information from pertinent and relevant sources like scholarly books scientific papers etc.

2.1.1 Purpose of reviews of the related literature:

- It establishes the authors' in-depth understanding and knowledge of their field subject
- It gives the background of the research.
- Illuminates on how the knowledge has changed within the field
- Highlights what has already been done in a particular field
- Information of the generally accepted facts, emerging and current state of the topic of research
- Identifies the research gap that is still unexplored or under-researched fields
- Demonstrates how the research fits within a larger field of study

2.2 Studies carried out abroad:

- 1. D. Jesuiya, HDC Priyadarshini Faculty of Education, The Open University of Sri Lanka, Colombo, Sri Lanka (2021)** conducted study on Teacher's Perception on Online Teaching Method during Covid-19: With Reference to School Level Teachers at Faculty of Education, The Open University of Sri Lanka. The study shows that students are satisfied with online classes and get ample teacher help, but they do not assume that conventional classroom teaching would be replaced by online classes. It also finds that due to a lack of proper preparation and growth for doing online classes, teachers face difficulties in conducting online classes. The biggest challenge for online classes is technological and network challenges. To accomplish this aim, teachers and students must periodically take training and improvement programs from schools or government. There is a need to consider the barriers that come in the way of embracing online learning and taking corrective steps to address it.
- 2. Priyantha Julian Perera Faculty of Medicine, Wayamba University of Sri Lanka Mithila Manjaree Rajakaruna Faculty of Medicine, Wayamba University of Sri Lanka conducted study on Comparison of 'In-Person' Vs 'Online' Teaching (Oct.2021)** according to Student Perception; Along with all other human activities, education at all levels has been severely curtailed by the Covid 19 pandemic. Most educational institutions responded to this challenge by shifting their teaching activities from the traditional 'in-person' teaching to the 'online' platform. Though 'online teaching' has been around for some time, it was a novelty at many educational settings. This novelty was eagerly embraced by most of the students, but with time, especially in resource limited settings student opinion might have altered. This study from a newly established medical school in Sri Lanka, discuss the student perceptions comparing 'in-person' vs 'online' teaching. Regular student and teacher feedback will be useful in this regard. A

highbred system of education, combining online and in-person teaching is recommended for the future.

3. **Rasmitadila Rusi Rusmiati Aliyyah Reza Rachmadtullah, Achmad Samsudin , Ernawulan Syaodih Muhammad Nurtanto Anna Riana Suryanti Tambunan Universitas Djuanda, Jawa Barat, Indonesia (2020)** conducted the study on the perception of primary school teachers of online learning during the COVID 19 pandemic period at Universitas Djuanda, Jawa Barat, Indonesia. This study explores the perceptions of primary school teachers of online learning in a program developed in Indonesia called School from Home during the COVID-19 Pandemic. Data were collected through surveys and semi-structured interviews with 67 class teachers in primary schools. Data analysis used thematic analysis of qualitative data. The analysis results found four main themes, namely, instructional strategies, challenges, support, and motivation of teachers. This research contributes to the literature of online collaborative learning between teachers, parents, and schools that impact student success. Broadly, the success of online learning in Indonesia during the COVID-19 Pandemic was determined by the readiness of technology in line with the national humanist curriculum, support and collaboration from all stakeholders, including government, schools, teachers, parents and the community.
4. **Ragad M Tawafak*1,3, Abir AlSideir1 , Ghaliya Alfarsi1 , Maryam Nasser A Oman(2019)** conducted study on E-learning Vs. Traditional Learning for Learners Satisfaction. This study aims to focuses on improving e-learning to enhance students' continuous intention to use e-learning that will change students' perception level and academic performance for the better. The main work depends on comparison between multi types of e-learning systems and the simplicity of learning feedback from the learners to communicate between themselves through the whole learning process. This research reveals the need to extend TAM, TTF,

and partial ECT model factors with e-learning model factors of goals, activities, feedback and evaluation based on the model development needs that could be implemented for future research related to types of e-learning models.

5. **Yun Hong Sun Yat-Sen University Guanghua School of Stomatology Xiaolan Li Sun Yat-Sen University Guanghua School of Stomatology Yingwen Lin Sun Yat-Sen University Guanghua School of Stomatology Jun Xie Sun Yat-Sen University Guanghua School of Stomatology Xutong Yan Sun Yat-Sen University Guanghua School of Stomatolog (2018)** conducted study on A Comparative Study of Online Education and Traditional Offline education during COVID-19. This article aims to conduct a comparative analysis of teacher-student surveys between online live teaching and traditional off-line teaching and explore the direction of medical education reform in colleges and universities. In the future, with the addition of online teaching, stemmatological education could adopt a new mode of the combination of online and offline teaching as well as the integration of inside and outside of the classroom.

6. **Sharmin Sultana BRAC University Dhaka Bangladesh. (APRIL2016)** conducted the study on preferences towards modern day teaching and traditional teaching aids among the Bangladeshi tertiary level students BRAC University Dhaka Bangladesh. The researcher followed quantitative pattern to collect the concrete answers from the participant. In the study it is found that many of the students are considering multimedia as it is easy to operate and the learning materials are ready by the teachers. They do not have to go through the books as they have slides. This may concern in terms of giving effort to learning. But blackboard use for language class makes both teacher and students give more attempts for the class. So yes for learning effective teaching aid is essential. But teacher's perception also essential for convenient mode of teaching.

7. **Shweta Singh, David H. Rylander, Tina C. Mims Woman's University Denton, Texas (United States of America) (JAN.2012)** conducted the study on Efficiency of Online vs. Offline Learning: A Comparison of Inputs and Outcomes. This study seeks to estimate the efficiency of students who take online courses relative to the efficiency of students who are enrolled in offline courses. Efficiency outcomes are defined in terms of (1) quantitative scores achieved by the student at the end of the course, (2) the student's viewpoint of how much they learned in the course and (3) the student's level of satisfaction with the course. The authors use Data Envelopment Analysis (DEA) to estimate a model of student efficiency. But teacher's perception and their efficiency also play a huge role in learning.
8. **Shahinshah Babar KHAN & Nabi Bux JUMANI Pakistan Atomic Energy Commission Model College Islamabad, Pakistan (2012)** conducted the study on the e-learning vs traditional learning in Pakistan. The objectives of the study were to examine the use of e-learning and traditional learning in Pakistan at the higher education level and to compare the effectiveness of e-learning and traditional learning with the use of surveys. A small sample group of Bachelor of Computer Science and Master of Computer Science of Allama Iqbal Open University (AIOU) were selected as the traditional group and the same number of distance students of the same subjects attending Virtual University of Pakistan were selected for the study. A questionnaire was developed for both target groups to inquire their opinions of traditional and online learning.
9. **Mary F. Fortune, Melany Spielman, T. Pangelinan California state university (2011)** conducted the study on the student's perception online or face to face learning and social media and hospitality, recreation, and tourism at the California state university east bay this study was to measure student learning perception related to hospitality recreation and tourism program of the study that to uses two distinct teaching modalities online and face to face classroom platform. The other purpose was to explore the use of leisure time and online social networking. The

approach for this study was to replicate prior research procedures and use the survey instrument developed by Fortune, Shifflett, and Sibley (2006) that measured learning perceptions of students enrolled in business communication courses in the two different learning environments—online and Face to face. The tool used for the study was survey questionnaire which was distributed to students enrolled in several sections of Recreation 1000 in spring 2009. The result indicated that online teaching is more convenient for the tertiary level of the students. Based on the study it is clear that the students have chosen their comfortable mode of teaching which is online. But success rate of the effective teaching mode must be measured by the achievement of the students and teacher's perception also important for the effective teaching.

10. Ashutosh kumar Singh and Mohd Amaluddinyus of Curtin University and technology. Miri, Malaysia (2009) conducted the study on comparative study between traditional learning and E-learning at the Curtin University and technology. Miri, Malaysia. Due to the merits and demerits of both methods it's very difficult to replace each other. The main deciding factor for the use of any one is based on individual interest. If someone at higher age with maturity and stability to learn by himself and have experienced or part of the classroom learning before, then he/she will be successful with a flexible environment and personal motivation for E-learning. But new learners especially at a younger age with no background of the learning area would not accept E-learning as they may find it difficult with no interaction with the teacher to clarify their ambiguity. As people learn from friends, society and groups, it is also very difficult for them to learn alone without practically being involved in the process. Regarding this my study is for secondary school teacher to understand the effective mode of teaching for effective learning.

2.3 Studies carried out India:

- 1. Mrs. R .Nithya.,Dr.S Sridevi,MS B Geetha Ramani Sunderbani jain college for women T-nagar Chennai (Jan.2021)** conducted a comparative study on faculty perception on online and offline teaching. Due to pandemic physical teaching classes suddenly shifted on online classes this sudden and drastic change has turn in to the great task for faculty member therefore this attempt has been done to know the perception of faculty of college and they have chosen the faculty of college. This change has been done in all the level of education system. College level of faculties have successfully adopted of this new mode of teaching to avoid interference in the student's career. But at the secondary level how efficiently the teachers have adopted this new mode of teaching is to another study.
- 2. Kulal Abhinandan conducted study on perception of teachers and students toward online classes in Dakshina Kannada and Udupi District. (2020)**
Purpose of the study was analyzing the perception of teachers and students about online classes. The work tries to explain the opinions of students as regards the impact of online courses, their comfortability in its usage, and the support received from teachers in online classes along with teachers' opinions on efficacy, teaching practice followed and training received for an online class. The study reveals that students are comfortable with online classes and are getting enough support from teachers but they do not believe that online classes will replace traditional classroom teaching. It also finds that teachers are facing difficulties in conducting online classes due to a lack of proper training and development for doing online classes. Technical issues are the major problem for the effectiveness of the online classes.

3. **Naman Wadhwa¹ (Student, B. Tech Biotechnology) Sunita Khatak* ¹ (Assistant Professor) Poonam² (Assistant Professor)** **1.Department of Biotechnology, University Institute of Engineering & Technology, Kurukshetra University, Kurukshetra Haryana,(2020)** India conducted study on Online versus Offline Mode of Education –Is India ready to meet the challenges of Online Education in lockdown?To analyze the effects of sudden embracement of online mode by students and teachers one survey was conducted where the major population involved was of students, teaching faculty and parents of school going children.The basic infrastructure in India being a developing country needs to be furnished by government before implementing online education on mass scale. Learning is the crux of how we humans sustain and progress. Both online and offline learning educates people to help them become productive members of society. There is not a single learning mode that can be guaranteed to be 100% effective. Taking the best of these two core systems and combining them is what needs to be done as relying on only one of the above-mentioned modes can never be very effective, it has to be a blend of both.
4. **Shivangi Dhawan, Department of Commerce, SGTB Khalsa College, University of Delhi, Delhi, India (2020)** conducted study on Online Learning: A Panacea in the Time of COVID-19 Crisis.The World Health Organization declared it as a pandemic. This situation challenged the education system across the world and forced educators to shift to an online mode of teaching overnight. Many academic institutions that were earlier reluctant to change their traditional pedagogical approach had no option but to shift entirely to online teaching–learning. The article includes the importance of online learning and Strengths, Weaknesses, Opportunities, & Challenges (SWOC) analysis of e-learning modes in the time of crisis. This article also put some light on the growth of Ed Tech Start-ups during the time of pandemic and natural disasters and includes

suggestions for academic institutions of how to deal with challenges associated with online learning.

5. **Deepika Nambiar, Assistant Professor, Post-Graduate Department of Psychology, Bishop Cotton Women's Christian College, Karnataka, India (2020)** conducted study on the impact of online learning during COVID-19: students' and teachers' perspective. The purpose of this study was to conduct an online survey regarding teacher's and student's perception and experience related to online classes. Delivery of classes through online medium has been a recent modification brought out by the education system in India in the wake of the current pandemic situation. The result of this study indicates that face- to- face learning was perceived more positively than online learning in term of social presence, interaction, satisfaction and overall quality. Even though online classes were reported to be convenient in term of saving time, still both teachers as well as the students perceived it to be less effective and structured when compared to classroom mode of learning.
6. **Ram Gopal, Varsha Singh, Arun Aggarwal Chitkara College of Hospitality Management, Chitkara University, Chandigarh, Punjab, India(2020)** The aim of the study is to identify the factors affecting students' satisfaction and performance regarding online classes during the pandemic period of COVID–19 and to establish the relationship between these variables. The results show that four independent factors used in the study viz. quality of instructor, course design, prompt feedback, and expectation of students positively impact students' satisfaction and further student's satisfaction positively impact students' performance. For educational management, these four factors are essential to have a high level of satisfaction and performance for online courses. This study is being conducted during the epidemic period of COVID- 19 to check the effect of online teaching on students' performance.

7. **Ranu Rawat¹, Parmal Singh Associate Professor; Associate Professor, Deptt. of Community Medicine, Adesh Medical College and Hospital, Shahabad, Kurukshetra, Haryana India (2020)** conducted A Comparative Study between Traditional and Online Teaching-Learning: Medical Students' Perspective in the Wake of Corona Pandemic. This study was aimed to compare the perspectives of medical students regarding Traditional and Online Teaching-Learning and to explore the association between the perception of the students regarding the preferred method and their respective gender. A higher proportion of students agreed that online teaching as compared to traditional teaching was more convenient, more cost-effective, more time-consuming, more tiring, more prone to distractions, provides more learning and has more retention while a higher proportion of students disagreed that online teaching as compared to traditional teaching was more interesting, more motivating, more satisfying and provides for more understanding. A significant association was detected between a few crucial variables and gender of the students. Clear cut superiority of either method could not be conclusively established. Majority of the students responded in favor of mixed or blended learning. This method could be explored in future. To iron out the effect of gender on the differing perspectives, upgrading the technology know-how of the students coupled with counseling could be resorted to.
8. **Dr. Harish B. Bapat, Professor, Medi-Caps University, Indore, India. Ms. Snehal Y. Hole, Assistant Professor, Sanjivani College of Engineering Department of MBA, Kopargaon, Ahmednagar, Maharashtra, India (2020).** This study tries to contemplate the nature of scholarly conveyance through online mode when contrasted with conventional actual study hall mode. Studies have exhibited that course association and structure, learning responsibility, understudy commitment, and instructor vicinity have spoken to huge difference in understudy

fulfillment and insights in web based learning climate. This is a pioneering study on this theme subsequently restricted up to the fundamental domain.

9. **Archana Choudhary Devi Ahilya University Indore (MP) (2015)** conducted study on A Comparative Study of E-Learning Technique with Traditional Teaching Techniques. This study focuses upon a comparative study of E-learning teaching techniques with traditional teaching techniques. The feedback from different user groups –students, researchers, teachers and staff is considered for traditional teaching techniques and e-learning based teaching techniques. The tools used showed the effectiveness of e-learning techniques over traditional teaching methods. The study showed that e-learning techniques attained high positive feedback for e-learning techniques as compared to traditional teaching methods for all the user categories

2.4 Conclusion:

In literature, there are studies that have reported student perceptions about the effectiveness of face-to face learning and of online learning. Changes in learning systems force schools to implement distance education or online learning, e-learning. Distance learning or using online systems have provided solutions for schools that are starting to implement the School from Home (SFH) system. SFH is a program that migrates the learning process from school to home. Based on the instructions of the Ministry of Education and Culture, schools are to organize online learning to provide a meaningful learning experience for students without being burdened with the demands of achieving all curriculum requirements. In this, SFH considers the health and safety of students, educators, education staff, and the community. Teachers, as the spearhead of the implementation of online teaching, must be able to condition all instructional components. Therefore, in my study I did comparison of Online teaching mode and Offline teaching mode on the basis of Class preparation, Content Delivery Class interaction and Student

Assessment that will be used in teaching, that significantly affect teachers' teaching. Teachers have tasks and responsibilities that are not easily transferrable when they must change from the face-to-face learning system in the classroom to an online system coupled with online learning experiences that have never been implemented before. A teacher must overcome all the problems that occur in Online teaching responsively so that the learning continues to achieve the targets set. This study explores the perceptions of secondary school teachers for Online teaching mode vs Offline teaching mode.

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CHAPTER 3

RESEARCH DESIGN

3.1 Introduction:

“Research design is a master plan specifying the methods and analyzing the needed information”

William Zikmund

Research design is the framework of research methods and techniques chosen by a researcher. The design allows researchers to hone in on research methods that are suitable for the subject matter and set up their studies up for success. The design of a research topic explains the type of research. There are three main types of designs for research Data collection, measurement, and analysis.

The type of research problem an organization is facing will determine the research design and not vice-versa. The design phase of a study determines which tools to use and how they are used. An impactful research usually creates a minimum bias in data and increases trust in the accuracy of collected data.

Features of good research design:

Neutrality: When we set up our study, we may have to make assumptions about the data we expect to collect. The results projected in the research question should be free from bias and neutral. Understand opinions about the final evaluated scores and conclusions from multiple individuals and consider those who agree with the derived results.

Reliability: With regularly conducted research, the researcher involved expects similar results every time. Our design should indicate how to form research the standard of results. We'll only be able to reach the expected results if our design is reliable.

Validity: There are multiple measuring tools available. However, the only correct measuring tools are those which help a researcher in gauging results according to the objective of the research. The questionnaire developed from this design will then be valid.

Generalization: The outcome of our design should apply to a population and not just a restricted sample. A generalized design implies that our survey can be conducted on any part of a population with similar accuracy.

The above factors affect the way respondents answer the research questions and so all the above characteristics should be balanced in a good design.

3.2 Need for research design:

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. Just as for better, economical and attractive construction of a house, we need a blueprint (or what is commonly called the map of the house) well thought out and prepared by an expert architect, similarly we need a research design or a plan of data collection and analysis for our research project.

Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money. Preparation of the research design should be done with great care as any error in it may upset the entire project. Research design has a great reliability of the result of the research work. The Design is given to others for their feedback and critical evolution.

3.3 Research Method of the study:

Research methodology is described as the tool of trade for any one research to be carried out. It is the science of studying how research is done scientifically.

Research methods are the strategies, process or technique used for the collection of data or evidence for analyzing new information or for having clear views of the topic.

There are basically three types of research methods that use different tools for data collections.

- Historical Research
- Experimental Research
- Descriptive Research

a) Historical Research involves studying, understanding and interpreting past events. The purpose of historical research is to reach conclusions or conclusions about past events or experiences. Historical research involves more than simply compiling and presenting factual information and requires the interpretation of information.

b) Experimental research describes a situation when certain variables are controlled or manipulated therefore, establish a systematic and logical association between manipulated factors and observe the effects. The researcher defines a problem and proposes a tentative answer or hypothesis. He tests the hypothesis and accept or rejects it in the light of the controlled variable relationship that he has observed.

There are three types of experimental methods which are as follows

1. Pre experimental method
2. Quasi experimental method
3. True experimental method

c) Descriptive methodology is concerned with present situation and it studies the relationship /differences that exist.

According to Best and Kahn' "Descriptive research is concerned with hypothesis formulation and testing and the analysis of relationship between non manipulated variables and the development of generalization"

Descriptive research classified variously by various writers. Some have classified them on the basis of the purpose they achieve, some on the geographical area they cover and some on the basis of the techniques they employ. These classifications mostly range from the survey, which describe the status quo of educational variables, to the Correlational study, which investigates the relationship between variables. For the sake of convenience descriptive may be classified in the following categories:

1. Survey Studies
2. Interrelationship studies
3. Developmental studies

A selection of research method was done keeping in mind the nature, objectives availability of tool and condition under which the research is conducted. The descriptive Survey method was used for data collection as it deals with the relationship among non-manipulated variables and the event and condition that have already occurred.

For the present study since the study deals with the teachers at secondary school and different mode of teaching methods on the basis of classroom preparation, Content delivery, Classroom Interaction, Student assessment, descriptive method was used. One of the categories of the descriptive method is survey method. Survey studies help to collect and provide three kind of information of which exist with respect to variable or condition in the situation.

3.4 Population and Sample of the study:

A population refers to any collection of specified group of human beings or of non-human entities such as objects, educational institutions, time units, geographical areas, price of wheat or salaries drawn by individual. A population containing a finite number of individuals, members or units is called a finite population. The population of concrete individuals is called existent population, while the collection of all possible ways in which an event can materialize as the hypothetical population.

To select a sample from a given population, it is also necessary to have a complete, accurate and up to date list of all the units in the population. Such list is known as sampling frame. After defining a population and listing all the units, a researcher selects a sample of units from the sampling frame. The process is called sampling. A good sample must be as nearly representative of the entire population as possible and ideally it must provide the whole information about the population from which the sample has been drawn. The logic of the theory of sampling is the logic of induction, that is we proceed from particular (i.e. sample) to general (i.e. population) and all the result are expressed in term of probability.

For the present study the Teachers of secondary section of school in Navi Mumbai constituted the population.

3.5 Sampling techniques:

The process of sampling makes it possible to draw valid inference of generalization on the basis careful observation with a relatively small proportion of the population.

According to Vokell, “Sampling refers to the strategies which enables the researcher to pick a subgroup from a larger group and then use this as the basis for making judgement about the larger group.”

The characteristics of a good sample are as follows

- It should be free from error or bias.
- A sample should be goal oriented. It means it should be oriented to the research objectives and fitted to the survey conditions.
- A sample should be accurate representative of the population from which is taken.
- A sample should be proportional. It should be large enough to represent the population properly.
- A sample should be selected as random. This mean that any item any item in the group has full and equal chance of being selected and included in the sample. This makes the selected sample truly representative in character.

There are essentially two types of sampling methods.

1. Non- probability sampling
2. Probability sampling

Non-probability sampling: In non –probability sampling, the units are selected at the discretion of the researcher. It is based on concept of non-random selection sample. This type of Non-probability sampling techniques are as follows convenient sampling, quota sampling, purposive sampling and snowball sampling.

Probability sampling: In probability sampling, the units of the population are not selected at the discretion of the researcher. It is based on concept of random selection of sample. In this technique, the researcher must guarantee that every individual has an equal opportunity for selection and this can be achieved if the researcher utilizes randomization. Different types of Probability sampling techniques can be employed to obtain representatives samples which are Simple random sampling, cluster random sampling, stratified random sampling and Mixed and Multistage random sampling. For present study researcher has adopted the technique of Simple random sampling technique, A **simple random sample** is a randomly selected subset of a population. In this sampling method, each member of the population has an exactly equal chance of being selected. This method is the most straightforward of all the probability sampling methods, since it only involves a single random selection and requires little advance knowledge about the population.

for selecting the sampling units contrary to popular opinion, sample were not selected haphazardly rather they are chosen in a systematic random way so that operation of probability was utilized.

To obtain a representative sample and for the purpose of the study, three stage sampling techniques was used.

1. In the first stage of sampling the researcher identified the area of the study. The area selected was Navi Mumbai city.

2. In the second stage of sampling the researcher identified the schools in the Navi Mumbai.
 - a) Central Board schools
 - b) ICSE Board schools
 - c) State Board schools
3. In the third stage, the researcher selected the Teachers using the simple random techniques, where individuals are chosen such a way that each has an equal chance of being selected. Thus, in this study, the researcher selected secondary school teachers from the schools affiliated to the CBSE board, ICSE board as well as SSC board. The researcher then randomly selected the sample from secondary schools in Navi Mumbai. The school selected for study are given in the appendix C.

3.6 Tool Used for Study:

For collecting the relevant data for the present study, the tool was developed by the researcher. The items of the tool were prepared on the basis of information gathered through review of literature and similar and similar reading on form various online resources. To conduct the present study, the researcher developed Offline teaching mode and Online teaching mode in the form of multiple-choice questions.

The tool consists of two parts,

- Offline teaching mode as perceived by the school teachers (secondary)
- Online teaching mode as perceived by the school teachers (secondary).

The study examined the perspective of secondary school teachers about Offline teaching mode and Online teaching mode and its comparison in Offline teaching and Online teaching mode. For this investigation, the online survey was carried out using Google Form, because the questionnaire is the most suitable way and effectively to collect information or data.

To conduct the present study, the researcher developed an Online mode of teaching and Offline mode of teaching tool in the form of multiple -choice questionnaire. The tool

consists of two parts i.e., Online teaching mode and Offline teaching mode questionnaire comprising of multiple-choice question with 5 different option Strongly disagree, Disagree, Neutral, agree, strongly agree. Likert scale was used to find the comparison of convenience and effectiveness of both the mode.

- Tool A: Online teaching mode as perceived by the school teachers (Secondary)
- Tool B: Offline teaching mode as perceived by the school teachers (Secondary)

The tools A and B are attached in the Appendix D.

Tool A: Online teaching mode as perceived by the schoolteachers (Secondary)

A questionnaire was prepared to assess extent of comfort to the school teachers in Online teaching mode. The questionnaire attempts to measures this on the dimensions like classroom preparation, content delivery, classroom interaction and student assessment.

Tool B: Offline teaching mode as perceived by the school teachers (Secondary)

A questionnaire was prepared to assess extent of comfort to the school teachers in Offline teaching mode. The questionnaire attempts to measures this on the dimensions like classroom preparation, content delivery, classroom interaction and student assessment.

3.6.1 Tool preparation:

The selection of Suitable tool is essential for successful research for each type and every type of research activity undertaken, certain instruments are required to gather new facts or to explore new fields. Collection of the data directly or indirectly correlates to the objectives of the research. For collection of data there are various devices. The instruments employed as a means of data collection are called tools. Tools play an important role in research. They employ distinctive ways of describing and quantifying data. Researcher should be very judicious in the choice of tools so that the right tool is used. Different tools are suitable for collecting different types of data. The use of

particular research tool depends upon the type of research. The researcher may use one or more tools in combination for the purpose. A good tool should be well planned and should be prepared by researcher to collect information from the representative sample. The data gathered will be used to test hypothesis of the study.

The different types of tools are as follows:

- 1) Observation: The researcher observes sample under normal living condition or with special factor operating. There are two types of observations, Participant Observation and Non participant observation.
- 2) Questionnaire is a tool that is widely used to obtain facts about past, present and the anticipated vents/condition. There are two types of ques
- 3) Interviews are oral questionnaires. The required information is obtained orally from the sample. The interview is prepared properly and carefully by the interviewer. There are three types of interview- structured interview, non-structured interview and semi structured interview.
- 4) Rating scale: It is used to study degree, intensity or frequency of available data. There are three type of rating scale –numerical rating scale, category rating scale and graphical rating scale.

3.6.2 Validation of the tool:

The validity of a tool is defined as the accuracy with which a test measure what it attempts to measure. It can also mean the efficiency with which tool measures what it attempts to measure. There are four types of validity,

criterion related validity, face validity, content validity and construct validity. In general, a test is valid to be used in one situation but invalid if used in another.

For present study content validity of the tool was established by giving five experts. Based on their expert opinion and valid suggestion the items were finalized.

Refer Appendix B for the list of experts.

3.6.3 Pilot study - Reliability of the tool:

Reliability can be described as the degree of consistency that the tool demonstrates. According to Joppe (2000), reliability is the extent to which the results are consistent over time and are accurate representation of the total population under study. Reliability of the tools are done from the result of the pilot of the study. It emphasizes that if the results of the pilot study can be reproduced with a larger sample size under similar conditions. Then, the research tools are considered reliable.

In the present study, split-half method was used to estimate the reliability of the tools. The test was divided into two equivalent halves and the scores on half of the items were correlated with the scores of odd numbered were correlated with the scores on the other half. The scores of 30 teachers were considered and the scores off odd numbered were correlated with the scores of even numbered of the teachers. The coefficient, r the internal consistency was calculated using Spearman-Brown prophecy formula.

The formula used for calculation of 'r' is as follows:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where r = Karl Pearson product moment co-efficient of correlation

X = Scores of the even items in the Questionnaire

Y = Scores of the Odd item in the Questionnaire

$\sum$ = Symbol for summation

N = Total number of respondents

After the internal consistency of the entire test was calculated using Spearman Brown Prophecy formula as shown below:

$$\rho = \frac{2r}{1+r}$$

where

ρ = reliability Co-efficient

r = Karl Pearson product moment co- efficient of correlation

Table 3.6.3 Reliabilty test of the tool A									
Tool	Method	N	ΣX	ΣY	$\Sigma(XY)$	ΣX^2	ΣY^2	R	ρ
A	Split half	30	1657	1636	91113	92979	90634	0.52	0.68

Table 3.6.4 Reliabilty test of the tool B									
Tool	Method	N	ΣX	ΣY	$\Sigma(XY)$	ΣX^2	ΣY^2	r	ρ
B	Split half	30	1516	1599	81944	77720	87795	0.67	0.80

Using the split-half method, the reliability coefficient for Tool A and Tool B were found out to be 0.52 ,0.67 and reliability index was 0.68, 0.80 respectively. Thus, the tools were reliable and the researcher went ahead with them.

3.6.4 Scoring:

The respondents were asked to tick their response to each of the statement in the google form. Each question provided five options to the respondent to choose from, among the

five only one option to be chosen. The option provided were Strongly disagree, Disagree, Neutral, Agree, strongly agree. The respondents were asked to select their response to each of the 59 statements the option closest to their opinion. The scoring key were as follows:

Table 3.6.4 Scoring Key		
Items	Positive statement	Negative statement
Strongly Agree	5	1
Agree	4	2
Neutral	3	3
Strongly Disagree	2	4
Disagree	1	5

Refer appendix D for tool A & B

3.7 Data collection procedure:

Data collection is an essential and important stage in any research endeavor. Data collection is the stage where the researcher collects the data required for the investigation with the help of tool design. Permission letter granted from the Principals of the schools. For the present study, the data was collected in the form of self-structured questionnaire which was designed in three sections. In the first section, each respondent needs to fill out their demographic information. The fundamental goal of the second and third sections is to know the respondents' views about Online teaching mode and Offline teaching mode on the basis of Classroom preparation, Content Delivery Classroom Interaction, Student assessment. The Likert scale questions were used to get the responses about the Online teaching mode and Offline teaching mode through educators.

To collect the data, number of schools were contacted. A request letter authorized by respected principal-PCER submitted for allowing researcher to collect the study results from teachers of the school.

The researcher in the present study gave questionnaire to 230 teachers but got back only 199 questionnaires and thus a total 199 teachers formed the sample of the study of Navi Mumbai's schools of CBSE, SSC, ICSE boards. Refer appendix B for permission letter. Refer appendix c for list of school.

Table 3.7.1 Sample size by gender		
Gender	No.	Percentage
Male	46	23%
Female	153	77%
Total	199	100%

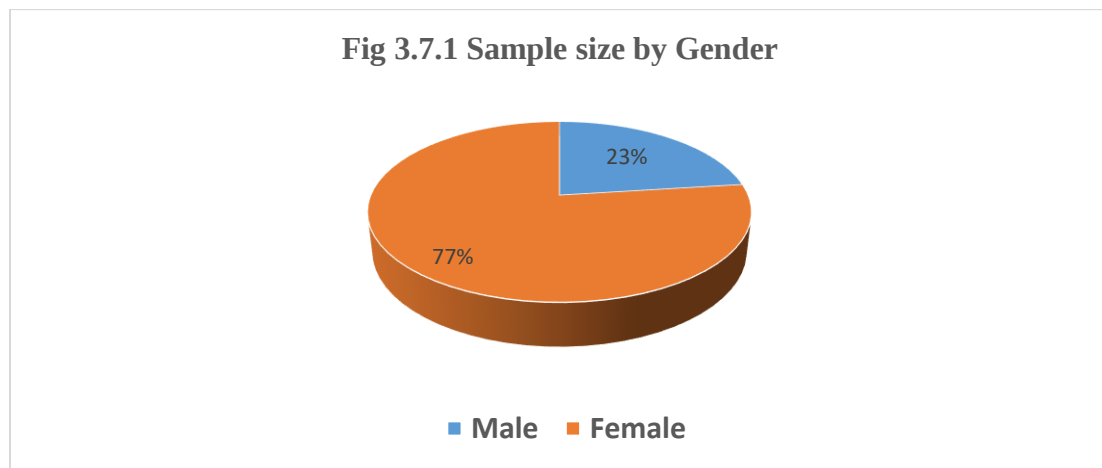


Table 3.7.2 Sample size by affiliated boards		
Boards	No.	%
CBSE	59	30%
ICSE	7	9.5%
SSC	133	66.5%
Total	199	100%

Fig.3.7.2 Sample size by affiliated board

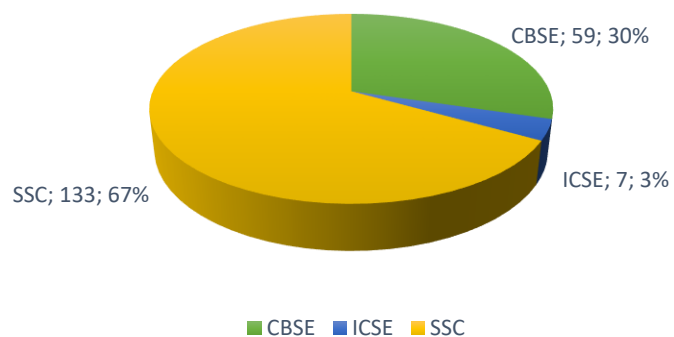


Table 3.7.3 Sample size by Teaching Subjects

Teaching subjects	No.	Percentage
Language	93	47%
Mathematics	44	22%
Science	36	18%
Social science	26	13%
Total	199	

Fig 3.7.3 Sample size by teaching subjects

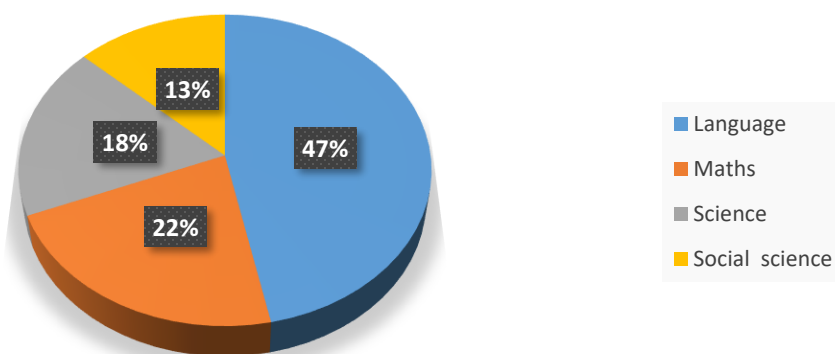
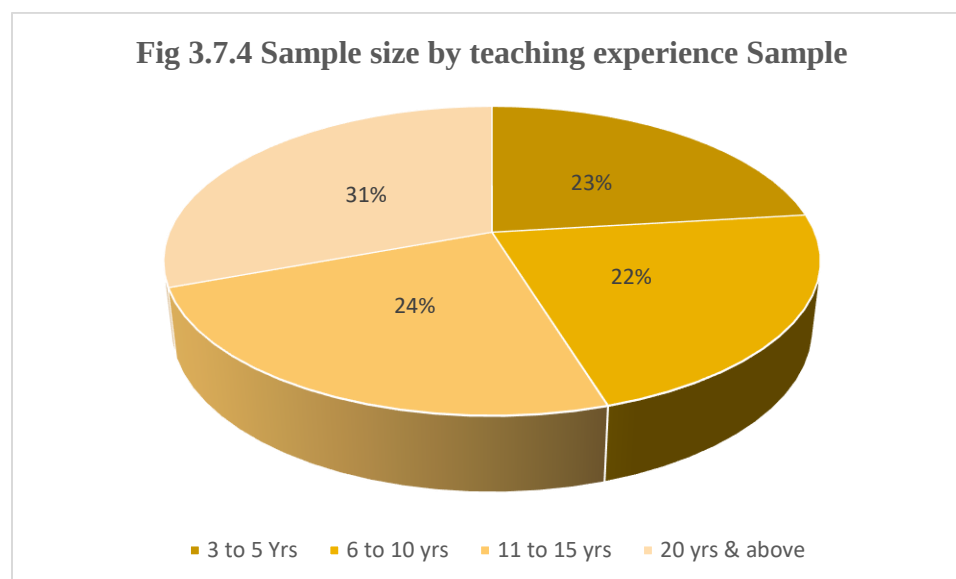


Table 3.7.4 Sample size by Teaching experience		
Experience	No.	%
3 to 5 years	46	23%
6 to 10 years	44	22.5%
11 to 15 years	48	24%
20 years and above	61	30%
Total	199	



3.8 Data Analysis:

Analysis of the data is done through both descriptive and inferential analysis. Descriptive statistics shows a simple Quantitative summary of asset of data collected. It helps in understanding the experiment or data set in detail and talks elaborately about the required details that help put the data in perspective. Descriptive statics simply state the raw data in summarized form. Descriptive statics uses a number of methods out of which measures of central tendency and measures of variability are used commonly.

Measures of central tendency such as the mean median and mode summarizes the performance level of group of scores, and measures of variability describe the spread of scores among the participant. Both are important as one provide the information on the level of performance, and other reveals the consistency of that performance.

Inferential statics is used for testing the significance of the hypotheses formulated for the study from the result obtained. This in turn, helps to reach conclusion based on the sample to be valid for the whole population.

3.9 Conclusion:

During the study, every effort had been made to follow all the basic principles of research methodology and conduct all the steps as ethically as possible. The study was conducted in fair manner keeping all prejudices aside. The raw data obtained were further analyze in following chapter.

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CHAPTER 4

DESCRIPTIVE DATA ANALYSIS

4.1 Introduction:

Analysis means classifying summarizing categorizing to obtain answer to the research questions. The data gathered is classified so that small bits of knowledge got from the classification provide a better understanding and conceptualization of the whole. Classification helps to reduce the data into intelligible and interpretable forms.

According to Denial Katz “Analysis is research technique for the objective systematic qualitative description of manifest content of communication.”

In analysis an attempt is made to convert the symbolic behavior into scientific data.

According to Best and Kahn “statistical analysis is of two types

1. Descriptive data analysis helps to describe the characteristics or nature of the group, no conclusions are intended beyond this group, and
2. Inferential data analysis where conclusions about the population are drawn based on observations of the sample.

Descriptive analysis is also known as descriptive statics. It is the quantitatively describing the main features of a collection of data. It describes basic feature of the data in study. It provides simple summaries about the samples.

Descriptive analysis together with simple graphical analysis forms the basis of inferential analysis. It is used to prescribe Quantitative description in manageable form. It helps to simplify large amount of data in a sensible way.

The measures used to describe data set are measures of central tendency and measures of variability or dispersion.

For the present study, the following descriptive analysis was done

- a. Measures of Central tendency – Mean and Median were calculated
- b. Measures of variability- Standard deviation, skewness and kurtosis were calculated with respect to Normal Probability Curve.

4.2 Descriptive Statistical Measures:

Measures of Central Tendency:

Measures of central tendency are commonly referred to as averages measures of central tendency are locaters of distribution on the scale of measurement. In educational research the most useful averages used by statisticians are the Mean, Median and Mode. In this study, the statically measure calculated were Mean and Median.

The Mean...of distribution is commonly understood as arithmetic average. The mean is the most commonly used method of describing central tendency. It is the expected value a random variable, which is also called the population mean. The formula for calculating mean is

$$\bar{X} = \frac{\sum Xi}{N}$$

Where $\bar{X}$ = The symbol used for mean (Pronounced X bar)

N= Total number of items

The mean is most useful of all statistical measures. Its chief use consists in summarizing the essential features of a series and enabling data to be compared. It is used for further statically calculations.

The median is the middle score for a set of data. Data is being arranged in order of magnitude the Median is less affected by outliers and skewed data.

Measures of variability:

Measures of central tendency describe the location along an ordered scale.

Dispersion is the spread of value around the central tendency. There are two common measures of dispersion, The range and standard deviation.

For the present study Standard deviation was calculated. Standard deviation summarizes an average distance of all the scores from the Mean of particular set.

Standard deviation is measure of variability and is square root of variance. Variance is the sum of squared from the Mean divided by the total number of cases. Standard deviation (SD) is calculated by the formula:

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{N}}$$

Where

$\bar{x}$ = The symbol we use for mean

$\sum$ = Symbol for summation

x_i = Each value in data set

N = Total number of items

Standard deviation is denoted by the absolute dispersion or variability of distribution. The greater is the amount of variability, the greater is Standard Deviation and greater will be the magnitude of the deviation of the values from the Mean. A smaller Standard Deviation means a high degree of the uniformity of the observation as well as the homogeneity of the series. Thus if we have two or more comparable series with the identical or nearly identical means, it is the distribution with the smallest Standard Deviation that has the most representatives Mean. Hence, Standard Deviation is extremely useful in judging the representativeness of the Mean.

The Normal Probability Curve:

The normal probability curve can be used as a model to compare various distribution with it i.e. to say whether the distribution is normal or not and if not, in what way it diverges from the normal. A normal curve is perfectly symmetrical curve in which the Mean,

Median and Mode are the same. This deviation or dispersion from normality tend to vary in two ways in term of skewness and in term of kurtosis.

Skewness-

Skewness refers to a distortion or asymmetry that deviates from the symmetrical bell curve, or normal distribution, in a set of data. If the curve is shifted to the left or to the right, it is said to be skewed. In a symmetric bell curve, the mean, median, and mode are all the same value. But in a skewed distribution, the mean, median, and mode are all different values. A skewed data distribution or bell curve can be either positive or negative. A **positive skew** means that the extreme data results are larger. This skews the data in that it brings the mean (average) up. The mean will be larger than the median in a skewed data set. A **negative skew** means the opposite: that the extreme data results are smaller. This means that the mean is brought down, and the median is larger than the mean.

The formula given in most textbooks is $\text{Skew} = 3 * (\text{Mean} - \text{Median}) / \text{Standard Deviation}$.

In order to use this formula, we need to know the mean and median, of course. As we saw earlier, the mean is the average. It's the sum of the values in the data distribution divided by the number of values in the distribution. And if the data distribution was arranged in numerical order, the median would be the value directly in the middle. Standard deviation tells you how different and varied your data set really is. Standard deviation shows you how far your numbers spread out from the mean and median.

Kurtosis:

The degree of peakedness and flatness of curve called kurtosis, denoted by Ku. This also known as percentile coefficient of Kurtosis and its formula given by

$$\text{Kurtosis} = \text{Quartile deviation} / 90^{\text{th}} \text{ percentile} - 10^{\text{th}} \text{ percentile}$$

$$\text{KU} = \text{QD/PR} \quad \text{Where QD} = \text{quartile deviation, PR} = \text{percentile range.}$$

When KU is

- Equal to 0.263, the curve is normal curve or Mesokurtic
- Greater than 0.263 the curve is Platykurtic or flat
- Less than 0.263 the curve is Leptokurtic or thin

Descriptive analysis is also including graphical representations in the forms of bar graph. In this study, the data was represented in the form of bar graphs and tables.

4.3: Descriptive analysis of the data:

For the present study, the data collected from the secondary school teachers in the questionnaire form which is parametric and is adopted to find comparison between Offline teaching mode and Online teaching mode with respect to gender, affiliated board, teaching subjects and teaching experience. Graphical representation in the form of bar graphs are used to represent the variables. The following is the descriptive analysis of the data as per the objectives. The objective wise descriptions are presented along with tabular and graphical representation.

4.3.1 Offline teaching mode and Online teaching mode as perceived by secondary teachers.

Table no 4.3.1: Comparison between Offline teaching mode and Online teaching mode							
Variables	N	Mode	Mean	Median	SD	Skew	Kurt
Offline mode	199	111	104.26	108	13.40	-0.68	0.24
Online mode	199	108	108.95	109	10.68	0.09	1.74

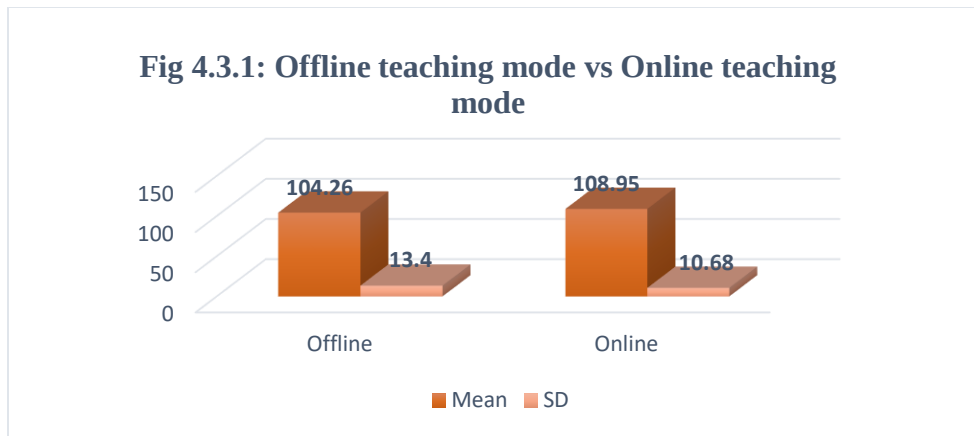


Table 4.3.1 and figure 4.3.1 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode. The Calculated Mean value of Offline teaching mode was 104.26 and its Standard deviation was 13.4.

The calculated mean value of Online teaching mode was 108.95 and its Standard deviation was 10.68. The Mean value of Online teaching mode was greater than offline teaching mode

In Offline teaching mode Median value is 108 which was higher than the mean value 104.26 therefore the distribution was negatively skewed. In Online teaching mode the Mode, Mean and Median value is very close, therefore, in Online teaching mode the given distribution is more or less symmetrical in nature.

The value of Kurtosis was -0.24 in Offline teaching mode which was slightly less than the normal distribution value 0.263 thus the distribution was close to Mesokurtic. Whereas, the value of Kurtosis was 1.74 in Online teaching mode which was higher than the normal distribution value 0.263 thus the distribution was platykurtic in the Online teaching mode.

4.3.2 Offline teaching mode and Online teaching mode among the secondary school teacher with reference to gender.

Table 4.3.2 Offline teaching mode and Online teaching mode with reference to gender							
Gender	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Male	Offline	46	102.67	107	13.81	-0.41	0.84
	Online		109.54	109.5	11.53	-0.33	2.35
Female	Offline	153	104.73	108	13.28	-0.76	0.03
	Online		108.78	109	10.44	0.24	1.63

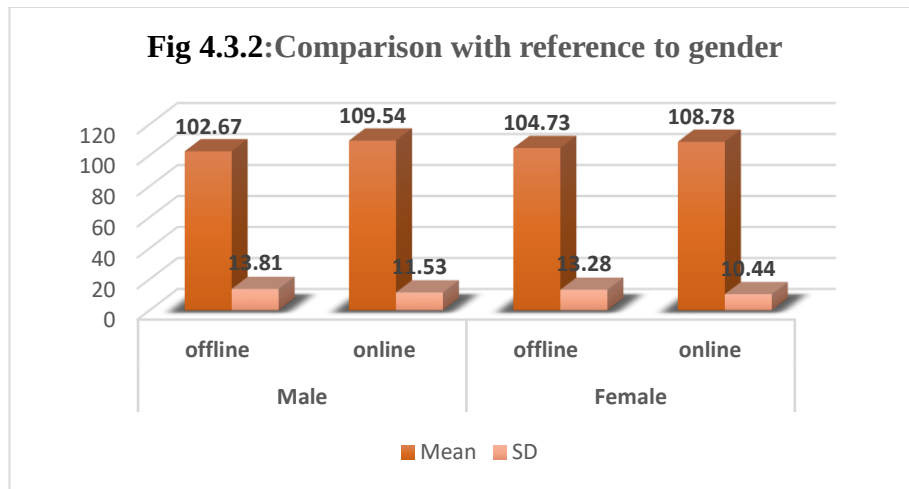


Table 4.3.2 and figure 4.3.2 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode.

The Calculated Mean value of Offline teaching and Online teaching mode based on female gender was 104.73 and 108.78 respectively. The Calculated Mean value of

Offline teaching and Online teaching mode based on male gender was 102.67 and 109.54 respectively.

The Mean score of Online teaching mode is greater than Offline teaching mode with reference to gender. Its Standard deviation of Offline and Online based on female gender 13.28 and 10.44 respectively and based on male gender SD was 13.81 and 11.53 respectively.

The Median value of offline and Online teaching mode of Male gender was 107 and 109.5 which was higher than the Mean value 102.67 and 109.54 respectively therefore the distribution was very slight negatively skewed.

The value of kurtosis of Offline and Online teaching mode based on Male gender 0.84 and 0.34 Which was higher than the normal distribution value 0.263 thus the distribution was slightly Platykurtic.

The Median value of Offline teaching mode of female gender was 108 which was higher than the Mean value 104.73 therefore the distribution was negatively skewed.

The Median value of Online teaching mode of female was 109 and Mean value was 108.78 which was very close to Median value therefore data distribution more or less symmetrical in Online teaching mode with reference to female teachers.

The Value of Kurtosis in Offline teaching mode of female gender was 0.03 Which was less than the normal distribution value 0.263 thus the distribution was leptokurtic in Offline teaching mode of Female gender.

In case of Online teaching mode, the value of Kurtosis is 1.63 which was higher than the normal distribution value 0.263 thus the distribution was platykurtic.

4.3.3 To compare the offline teaching mode and online teaching mode among the secondary school teacher with reference to affiliated boards.

Table 4.3.3 Offline teaching mode and Online teaching mode with reference to affiliated boards

Boards	Teaching mode	N	Mean	Median	SD	Skew	Kurt
CBSE	Offline	59	102.20	104	12.58	-0.89	0.73
	Online		110.64	110	12.22	-0.03	1.60
ICSE	Offline	7	107	109	14.44	-1.01	1.62
	Online		109	110	13.7	0.19	1.50
SSC	Offline	133	105.02	108	14.44	-0.65	0.53
	Online		108.20	110	10.09	0.07	1.50

Fig 4.3.3: Comparison based on affiliated boards

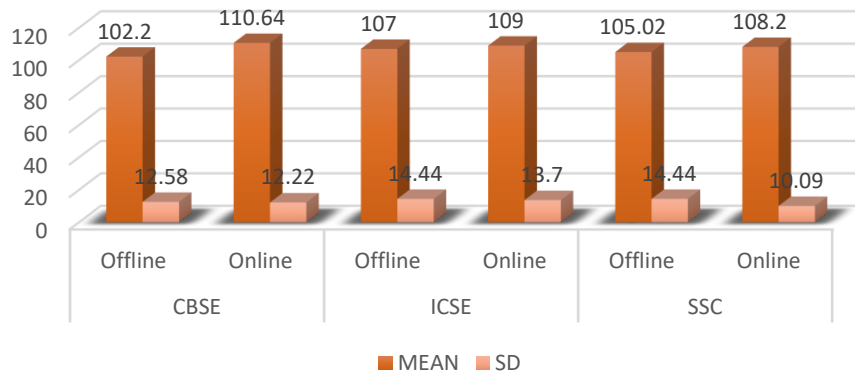


Table 4.3.3 and figure 4.3.3 given above shows the Mean and Standard deviation of Offline teaching mode and Online teaching mode based on different affiliated boards.

For Offline teaching mode and the Online teaching mode the calculated Mean score of CBSE board was 102.2, 110.64 respectively and Standard deviation was 12.58, 12.22. In CBSE board Online mode of Mean value is higher than Offline mode.

The calculated Mean score of ICSE board of Offline and Online mode was 107, 109 and its Standard Deviation was 14.44 and 13.7 respectively. In ICSE board the Mean Value of Online mode is higher than the Offline mode.

The calculated mean score of SSC board was 105.02, 108.2 and its standard deviation was 14.44, 10.09 respectively. In SSC board Mean Value of Online mode was higher than the Offline mode.

Median value of CBSE board in Offline teaching mode was 104 which was higher than the Mean value 102.20 therefore distribution was negatively skewed. In case of Online teaching mode, Median value is very close, therefore, in Online teaching mode the given distribution is more or less symmetrical in nature for CBSE board. Median value of ICSE board in Offline teaching mode was 109 which was higher than the Mean value 107 therefore the distribution is negatively skewed. In case of Online teaching mode Median value was 110 and the Mean value was 109 and the distribution was slightly positively skewed for ICSE board. Median value of SSC board in Offline and Online teaching mode was 108, 110 respectively which was higher than the mean value 105.2 and 108.20 respectively therefore the distribution was negatively skewed. The values of kurtosis in Offline teaching mode and Online teaching mode for CBSE was 0.73, 1.60 respectively which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic in CBSE board.

The value of kurtosis was in Offline and Online teaching mode for ICSE was 1.62 and 1.50 which was higher than the normal distribution value 0.263 thus both the distribution

was Platykurtic. The values of kurtosis were in Offline teaching and online teaching mode for SSC was -0.53 and -1.50 respectively. Which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic for SSC board.

4.3.4 To compare the Offline mode of teaching and Online mode of teaching with reference to subjects.

Table 4.3.4 Offline teaching mode and Online teaching mode with reference to teaching subjects							
Subjects	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Language	Offline	93	106.92	109	12.77	-0.88	0.93
	Online		108.01	109	11.6	-0.13	2.26
Mathematics	Offline	44	104.98	109	12.93	-0.92	0.01
	Online		109.88	110	9.27	0.07	0.93
Science	Offline	36	98.36	99	12.77	-0.09	0.99
	Online		109.86	109.5	10.11	1.04	2.60
Social science	Offline	26	101.65	108	14.88	-0.66	1.13
	Online		109.5	109	10.54	0.40	0.01

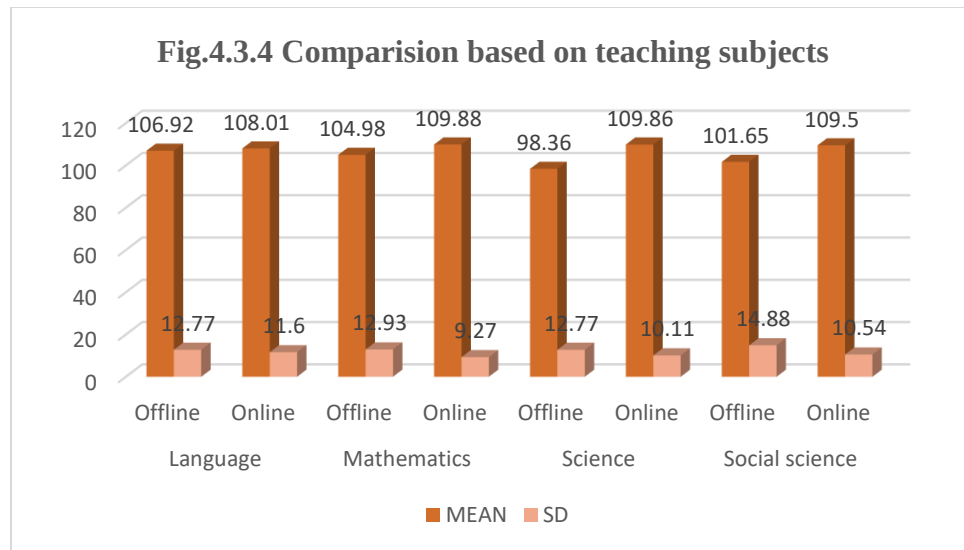


Table 4.3.4 and figure 4.3.4 given above shows the Mean and Standard deviation of Offline teaching mode and Online teaching mode with reference to teaching subjects.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to language teaching subject was 106.92 ,108.01 respectively and its Standard Deviation was 12.77 and 11.6 respectively.

The Mean value of Online mode of teaching for Language subject was Significantly higher than Offline teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Mathematics teaching subject was 104.98,104.88 respectively and its Standard Deviation was 12.93 and 9.27 respectively.

The Mean value of Offline mode of teaching for Mathematics subjects was Significantly higher than Online teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Science teaching subject was 98.36 and 109.86 respectively and its Standard

Deviation was 12.77 and 10.11 respectively. The Mean value of Online mode of teaching for Science subjects was Significantly higher than Offline teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Social science teaching subject was 101.65 and 109.5 respectively and its Standard Deviation was 14.88 and 10.54 respectively. The Mean value of Online mode for Social teaching subjects was higher than Offline teaching mode.

Median value of Offline and Online teaching mode with reference to Language teaching subjects was 109 and 109 respectively which was higher than the Mean value 106.92 and 108.01 respectively in the given distribution therefore the skewness is negative.

Median value of Offline with reference to Mathematics teaching subjects was 109 respectively which was higher than the Mean value 106.92 in the given distribution therefore the distribution was negatively skewed.

In case of Online teaching mode Mean and Median value was very close, therefore, in Online teaching mode the given distribution was more or less symmetrical in nature.

Median value of Offline and Online teaching mode with reference to Science teaching subjects was 99 which was higher than the Mean value 98.36 in the given distribution therefore the distribution was negatively skewed.

In case of Online teaching mode Median value was 109.5 and Mean value was 109.86 therefore the distribution was positively skewed with reference of Science teaching subject. The value of Kurtosis of Offline and Online teaching mode with reference to Language subject was 0.93 and 2.26 Which was higher than the normal distribution value 0.263 thus both the distributions were Platykurtic.

The value of Kurtosis of Offline with reference to Mathematics subject was 0.01 which was less than the normal distribution value 0.263 thus the distribution was Leptokurtic. In case of Online teaching mode with reference Mathematics subject the value of Kurtosis was 0.92 Which was higher than the normal distribution value 0.263 thus the distribution

was Platykurtic. The value of Kurtosis of Offline and Online mode with reference science subject was 0.99 and 2.60 which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic.

4.3.5 To compare the Offline mode of teaching and Online mode of teaching with reference to Teaching experience.

Table 4.3.5 Offline teaching mode and Online teaching mode among the secondary school teacher with reference to Teaching experience							
Experience	Teaching mode	N	Mean	Median	SD	Skew	Kurt
3 to 5 yrs.	Offline	46	100.56	104.5	12.57	-0.46	0.90
	Online		108.37	109	11.22	-0.43	2.34
6 to 10 yrs.	Offline	44	104.45	107.5	13.97	-0.82	0.53
	Online		109.04	108	13.05	0.06	0.77
11 to 15 yrs.	Offline	48	104.08	108	13.81	-0.73	0.48
	Online		108.58	108	10.68	0.77	2.71
20 yrs & above	Offline	61	107.03	109	12.88	-0.83	0.30
	Online		109.62	110	8.31	0.12	0.31

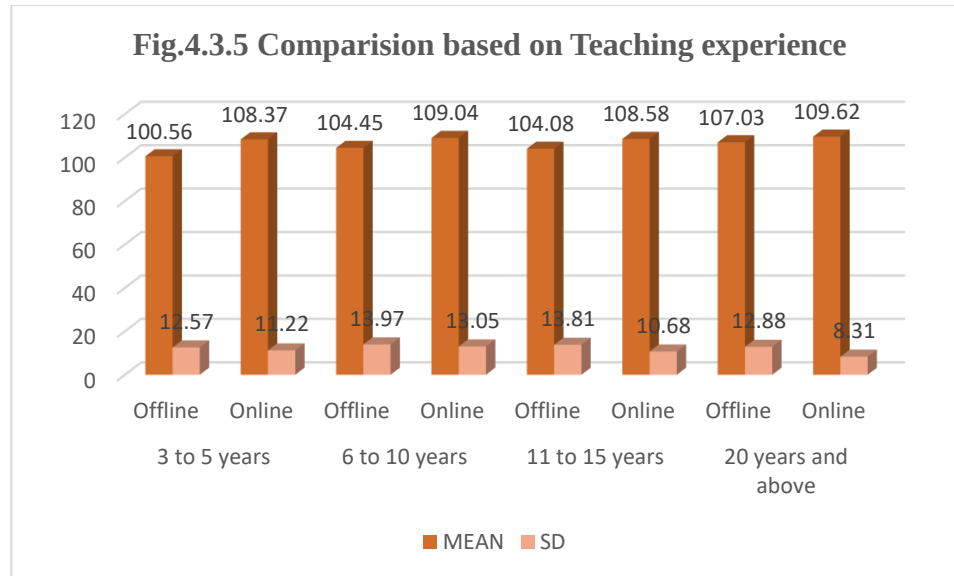


Table 4.3.5 and figure 4.3.5 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to teaching experience. The calculated mean value in Offline teaching mode and Online teaching mode of teachers with teaching experience of 3 to 5 years 100.56, 108.37 respectively and its Standard Deviation 12.57 and 11.22.

The Mean value of Online teaching mode was higher than the Offline teaching mode as per 3 to 5 years teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with teaching experience of 6 to 10 years 104.45, 109.04 respectively and its Standard Deviation 13.97 and 13.05.

The Mean value of Online teaching mode was higher than the Offline teaching mode as per 6 to 10 years teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with teaching experience of 11 to 15 years 104.08, 108.58 respectively and its Standard Deviation 13.81 and 10.68.

The Mean value of Online teaching mode was higher than the Offline teaching mode as per 11 to 15 years teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with teaching experience of 20 years and above 107.03 and 109.62 respectively and its Standard Deviation 12.88 and 8.31.

The Mean value of Online teaching mode was higher than the Offline teaching mode as per 20 years and above teachers teaching experience.

Median value in Offline and Online teaching mode with reference to teaching experience of 3 to 5 years 104.5 and 109 respectively which was higher than the Mean value 100.56 and 108.37 respectively mode value is greater than median so the distribution was negatively skewed.

Median value in Offline teaching mode with reference to teaching experience of 6 to 10 years 107.6 and Mean value was 100.56 and the distribution was negatively skewed.

In case of Online teaching mode Median value was 108 and Mean value was 109.62 and the distribution was positively skewed.

Median value in Offline teaching mode with reference to teaching experience of 11 to 15 years 108 and Mean value was 104.08 and the distribution was negatively skewed.

In case of Online teaching mode Median value was 108 and Mean value was 108.58 both values are very close to each other therefore the distribution was more or less symmetrical.

Median value in Offline teaching mode with reference to teaching experience of 20 years and above 109 and Mean value was 107.03 and the distribution was negatively skewed. In case of Online teaching mode Median value was 110 and Mean value was 109.6 both values are very close to each other therefore the distribution was more or less symmetrical.

The value of Kurtosis in Offline teaching mode Online teaching mode with reference to teaching experience 3 to 5 years was 0.90 and 2.34 respectively. which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teaching experience 6 to 10 years was 0.53 and 0.77 which was higher than the normal distribution value 0.263 thus the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode with reference to teaching experience 11 to 15 years was -0.48, 2.71 respectively which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teaching experience 20 years and above was 0.30 and 0.31 which was higher than the normal distribution value 0.263 thus both the distribution was Platykurtic.

4.3.6 To compare Offline mode and Online mode among the secondary school teacher with reference to classroom preparation.

Table no 4.3.6: Comparison between Offline teaching mode and Online teaching mode with reference to classroom preparation.							
Classroom Preparation	N	Mode	Mean	Median	SD	Skew	Kurt
Offline Mode of teaching	199	43	38.39	39	4.79	-0.43	-0.10
Online Mode of teaching	199	36	37.81	38	4.71	-0.06	0.27

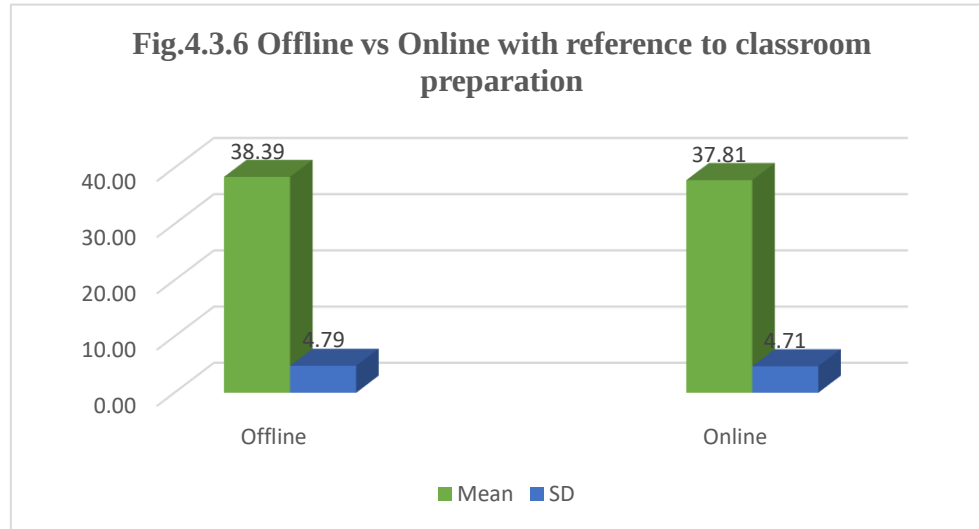


Table 4.3.6 and figures 4.3.6 given above shows the Mean and Standard Deviation of Offline teaching and Online teaching mode with reference to classroom preparation. The calculated Mean value of Offline teaching mode with reference to classroom preparation was 38.39 and its Standard Deviation was 4.79.

The calculated mean value of Online teaching mode with reference to classroom preparation was 37.81 and its Standard Deviation was 4.71. The Mean value of Offline teaching mode with reference to classroom preparation was higher than the Online teaching mode. The Median value of Offline teaching mode and Online teaching mode with reference to classroom preparation was 39 and 38 which was significantly higher than the Mean value 38.39, 37.81 therefore the distribution was negatively skewed.

The value of kurtosis was for Offline teaching was -0.10 which was less than the normal distribution 0.263 therefore the distribution was leptokurtic. In case of Online teaching mode value of Kurtosis was 0.27 which was almost same with the normal distribution 0.263 therefore the distribution was more or less Mesokurtic for classroom preparation.

4.3.7 To compare Online teaching mode and Offline teaching mode of classroom preparation on the basis of gender.

Table 4.3.7 Offline teaching mode vs Online teaching mode of Classroom preparation based on gender							
Gender	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Male	Offline	46	37.54	37.5	4.70	-0.17	-0.57
	Online		36.91	36.5	4.74	0.22	-0.46
Female	Offline	153	38.64	39	5.05	-0.51	0.16
	Online		38.08	38	4.68	-0.14	0.61

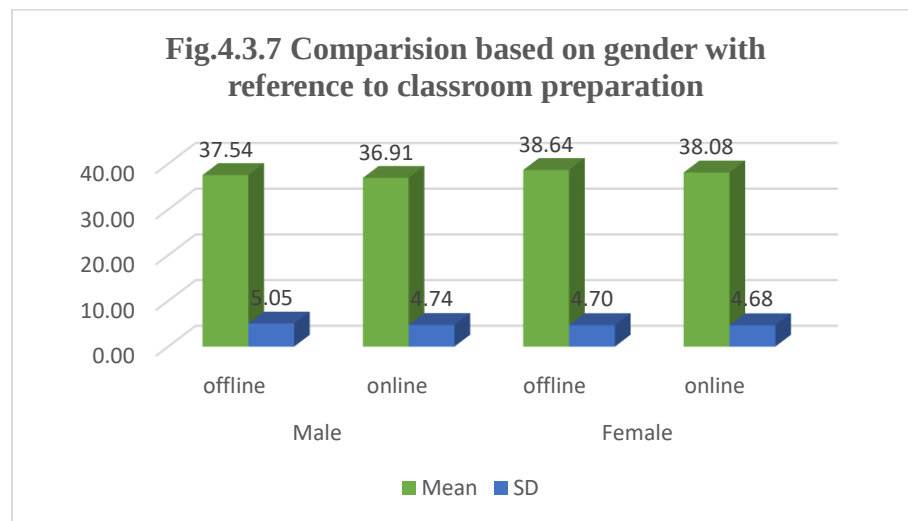


Table 4.3.7 and figure 4.3.7 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based on gender.

The calculated Mean value of Male teachers in Offline teaching mode and Online teaching mode with reference to classroom preparation was 37.54 and 36.91 respectively and its Standard Deviation was 5.05 and 4.74. The Mean value of Male teachers is higher in Offline teaching mode than the Online teaching mode.

The calculated Mean value of female teachers in Offline teaching mode and Online teaching mode with reference to classroom preparation was 38.64 and 38.08 and its Standard Deviation was 4.70 and 4.68 respectively.

The Mean value of Offline teaching mode with reference to classroom preparation was higher in Female teachers than the Online teaching mode. Median value of Male teachers in Offline teaching mode was 37.50, the Mean value was 37.54, both values are very close to each other therefore the distribution was more or less symmetrical in Offline teaching mode.

In Online teaching mode Median value 36.5 and Mean value was 36.91 and the distribution was positively skewed. The value of Kurtosis was in Offline teaching mode with reference to classroom preparation based on female was 0.16 which was less than the normal distribution 0.263 thus the distribution was Leptokurtic.

In case of Online teaching mode value of Kurtosis was 0.61 which was higher than the normal distribution 0.263 thus the distribution was Platykurtic.

4.3.8 To compare Offline teaching mode and offline teaching mode of classroom preparation on the based on affiliated boards.

Table 4.3.8 Offline teaching mode vs Online teaching mode of Classroom preparation based on affiliated boards.

Boards	Teaching mode	N	Mean	Median	SD	Skew	Kurt
CBSE	Offline	59	39.03	40	4.89	-0.42	-0.49
	Online		37.37	38	4.62	0.28	0.09
ICSE	Offline	7	40.57	41	3.87	-0.08	2.08
	Online		38.14	38	2.91	1.51	3.03
SSC	Offline	133	37.98	39	4.76	-0.45	0.06
	Online		37.99	38	4.83	-0.20	0.37

Fig.4.3.8 Comparison with reference to Classroom Preparation based on affiliated board

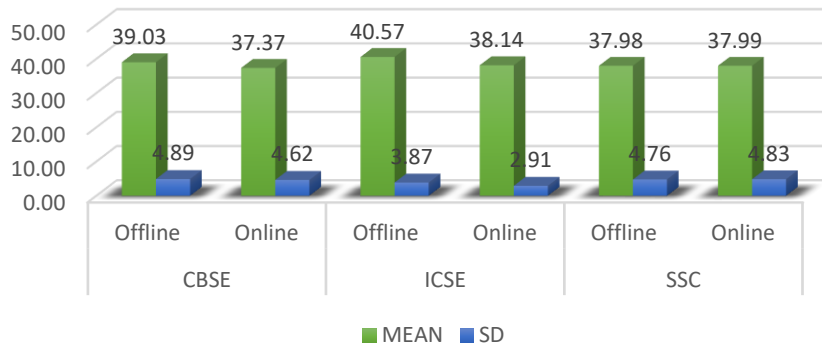


Table 4.3.8 and figures 4.3.8 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching with reference to Classroom Preparation based on affiliated boards. The calculated Mean value of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based on CBSE board was 39.03 and 37.37 and its Standard Deviation was 4.89 and 4.62 respectively.

The Mean value of CBSE board with reference to Classroom Preparation in Offline teaching mode was higher than the Online teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based on ICSE board was 40.57 and 38.14 and its Standard Deviation was 3.87 and 2.91 respectively.

The Mean value of ICSE board with reference to Classroom Preparation in Offline teaching mode was higher than the Online teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based on SSC board was 37.98 and 37.99 and its Standard Deviation was 4.76 and 4.83 respectively.

The Mean value of SSC board with reference to Classroom Preparation in Offline teaching mode and the Online teaching mode was almost same. Median value of CBSE board in Offline teaching mode was 40, the Mean value was 39.03 therefore distribution was negatively skewed.

In Online teaching mode Median value 38, Mean value was 37.37 Median value of ICSE board in Offline teaching mode was 41, the Mean value was 40.57 and the distribution was negatively skewed. In Online teaching mode Median value 38, Mean value was 38.14 both values are very close to each other therefore the distribution was more or less symmetrical.

Median value of SSC board in Offline teaching mode and Online teaching 39 and 38 respectively. The Mean value was 37.98 and 37.99 and the distribution was negatively

skewed. The value of Kurtosis in Offline teaching mode 0.49 which was higher than the normal distribution 0.263 thus the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value 0.09 which was less than the normal distribution 0.263 thus the distribution was leptokurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for ICSE board was 2.08 and 3.03 respectively which was higher than the normal distribution 0.263 thus both the distribution was Platykurtic. The value of Kurtosis in Offline teaching mode for SSC board was 0.06 which was less than the normal distribution 0.263 thus the distribution was Leptokurtic. In case of Online teaching mode Kurtosis value was 0.37 which was higher than the normal distribution 0.263 thus the distribution was Platykurtic.

4.3.9 To compare online teaching mode and offline teaching mode of classroom preparation on the basis of teaching subjects.

Table 4.3.9 Offline teaching mode vs Online teaching mode based on Classroom Preparation with reference to teaching subjects							
Subjects	Mode of teaching	N	Mean	Median	SD	Skew	Kurt
Language	Offline	93	38.73	39	4.47	-0.75	1.55
	Online		37.87	38	4.36	-0.08	0.26
Mathematics	Offline	44	36.80	36.5	5.14	0.01	0.91
	Online		37.91	37.5	5.42	-0.44	1.06
Science	Offline	36	39.67	41	5.32	-0.52	0.86
	Online		37.14	36.5	4.91	0.25	0.02
Social science	Offline	26	38.08	39	5.32	-0.43	0.72
	Online		38.38	38	4.51	0.71	0.001

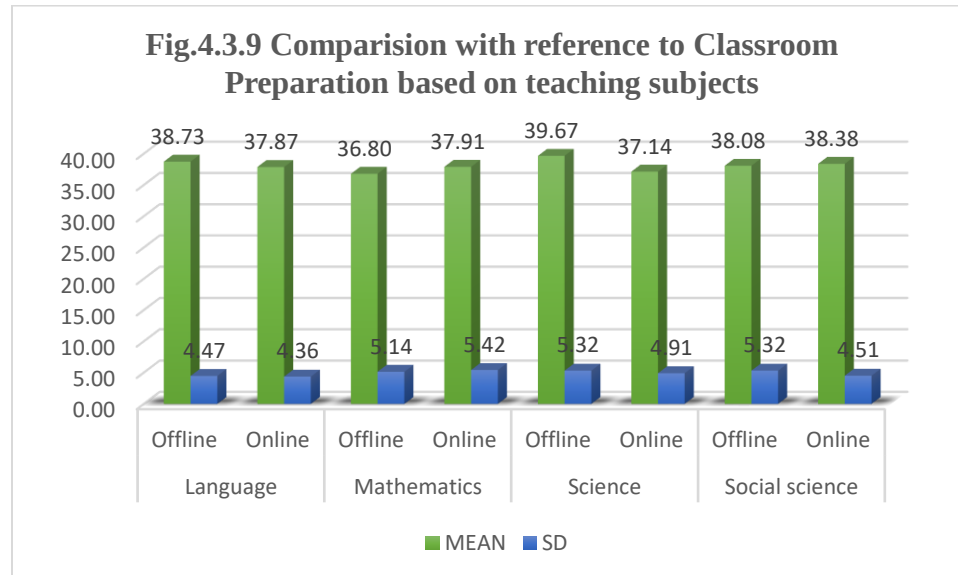


Table 4.3.9 and figures 4.3.9 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching with reference to Classroom Preparation based on teaching subjects.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to language was 38.73 and 37.87 and its Standard Deviation was 4.47, 4.36 respectively. The Mean value of Online mode of teaching for Language subject is Significantly higher than Offline teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Mathematics was 36.80 and 37.91 and its Standard Deviation was 5.14 and 5.42 respectively. The Mean value of Online mode of teaching for Mathematics subject is Significantly higher than Offline teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Science was 39.67 and 37.14 and its Standard Deviation was 5.32 and 4.91 respectively.

The Mean value of Offline mode of teaching for Science subject is Significantly higher than Online teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Social science was 38.08 and 38.38 and its Standard Deviation was 5.32, and 4.51 respectively. The Mean value of Online mode of teaching for Social science subject is Significantly higher than Offline teaching mode.

The Median value of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based teaching subjects Language was 39 and 38 respectively and Mean value was 38.73 and 37.87 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode with reference to Classroom Preparation based teaching subjects Mathematics was 36.5 and Mean value 36.8 was thus the distribution more or less symmetrical in nature.

In case of Online teaching mode Median value was 37.5 and Mean value 37.91 thus the distribution was negatively skewed. The Median value of Offline teaching mode with reference to Classroom Preparation based teaching subjects Science was 41 and Mean value was 39.67 thus the distribution was negatively skewed.

In case of Online teaching mode Median value was 36.5 and Mean value was 37.14 thus the distribution was positively skewed. The Median value of Offline teaching mode with reference to Classroom Preparation based teaching subject's Social science was 39 and Mean value was 38.08 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 38 and Mean value was 38.38 thus the distribution was positively skewed. The value of Kurtosis in Offline teaching mode with reference to classroom preparation based on Language subject was 1.55 which was higher than the normal distribution 0.263 thus the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value was 0.26 which was similar to normal distribution 0.263 therefore the distribution was Mesokurtic. The value of Kurtosis in Offline teaching mode and Online teaching mode for Mathematics subject was 0.91, 1.06

respectively which was higher than normal distribution 0.263 therefore both the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode for Science subject was 0.86 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.02 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode for Social Science subject was 0.72 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was -0.001 respectively which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

4.3.10 To compare Offline teaching mode and Online teaching mode of Classroom Preparation on the basis of experience.

Table 4.3.10 Offline teaching mode vs Online teaching mode based on Classroom Preparation with reference to experience							
Experience	Mode	N	Mean	Median	SD	Skew	Kurt
3 to 5 years	Offline	46	39.37	41	5.10	-0.72	0.16
	Online		36.65	36	4.58	0.26	0.21
6 to 10 years	Offline	44	38.18	39	4.21	-0.21	0.77
	Online		38.70	38	4.74	0.53	0.14
11to15 years	Offline	48	38.21	38.5	4.98	-0.57	1.05
	Online		37.83	38	4.75	0.21	0.64
20 years and above	Offline	61	37.93	38	4.80	-0.30	0.37
	Online		38.03	38	4.69	-0.96	2.08

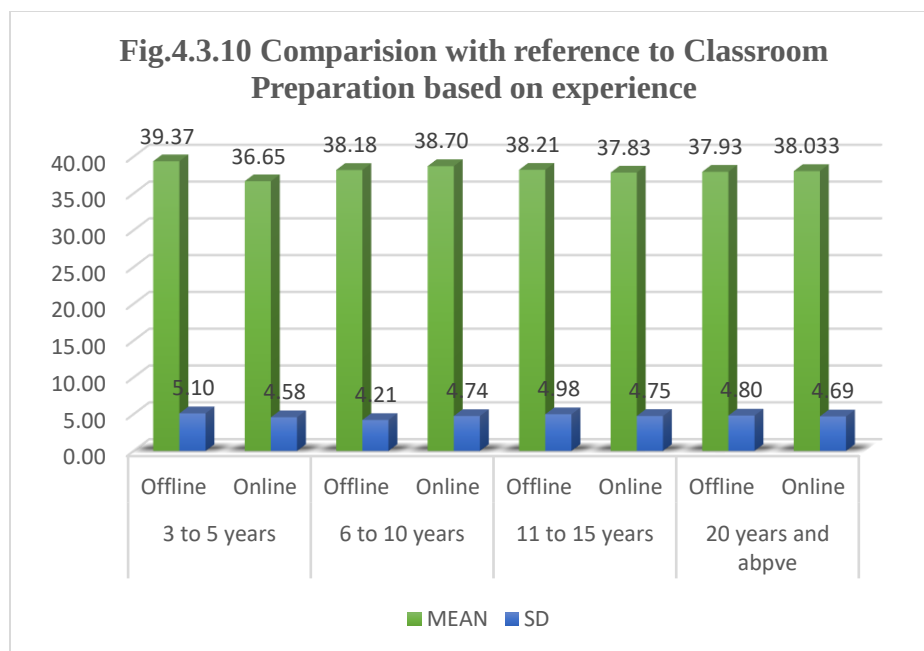


Table 4.3.10 and figure 4.3.10 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference Classroom Preparation based on teaching experience. The calculated mean value in Offline teaching mode and Online teaching mode of teachers with reference to Classroom preparation based on teaching experience of 3 to 5 years was 39.37 and 36.65 and its Standard Deviation 5.10 and 4.58 respectively. The Mean value of Offline teaching mode is higher than the Online teaching mode as per 3 to 5 years teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with reference to Classroom preparation based on teaching experience of 6 to 10 years was 38.18, 38.70 and its Standard Deviation 5.10 and 4.58 respectively. The Mean value of Online teaching mode is higher than the Offline teaching mode as per 6 to 10 years' teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with reference to Classroom preparation based on teaching experience of 11 to 15 years was 38.21, 37.83 and its Standard Deviation 4.98 and 4.75 respectively. The

Mean value of Offline teaching mode is higher than the Online teaching mode as per 11 to 15 years teachers teaching experience.

The calculated mean value in Offline teaching mode and Online teaching mode of teachers with reference to Classroom preparation based on teaching experience of 20 years and above was 37.93, 38.03 and its Standard Deviation 4.80, 4.69 respectively. The Mean value of Online teaching mode is higher than the Offline teaching mode as per 20 years and above teachers teaching experience.

Median value of Offline teaching mode with reference to Classroom Preparation based on teachers teaching experience of 3 to 5 years was 41 and Mean value was 39.37 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 36 and Mean value was 36.65 both the values are very close to each other therefore the distribution was more or less symmetrical.

Median value of Offline teaching mode with reference to Classroom Preparation based on teachers teaching experience of 6 to 10 years was 39 and Mean value was 38.18 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 38 and Mean value was 38.70 both the values are very close to each other therefore the distribution was more or less symmetrical.

Median value of Offline teaching mode with reference to Classroom Preparation based on teachers teaching experience of 11 to 15 years was 38.5 and Mean value was 38.21 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 38 and Mean value was 37.83 both the values are very close to each other therefore the distribution was more or less symmetrical. Median value of Offline teaching mode and Online teaching mode with reference to Classroom Preparation based on teachers teaching experience of 20 years and above was 38 and 38 and Mean value was 37.93 and 38.03 respectively, thus the distribution was negatively skewed.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 3 to 5 years was 0.16 and 0.21 respectively which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 6 to 10 years was 0.77, which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.21 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 11 to 15 years was 1.05, 0.64 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 20 years and above was 0.37 and 2.08 respectively, which was higher than the normal distribution 0.263 therefore both the distribution was Platykurtic.

4.3.11 To compare on line mode and Offline mode among the secondary school teacher with reference to Content Delivery.

Table 4.3.11 Offline teaching mode vs Online teaching mode with reference to Content Delivery							
Content Delivery	N	Mode	Mean	Median	SD	Skew	Kurt
Offline Mode of teaching	199	37	32.16	33	4.75	-0.45	-0.50
Online Mode of teaching	199	28	29.02	29	3.97	-0.21	1.15

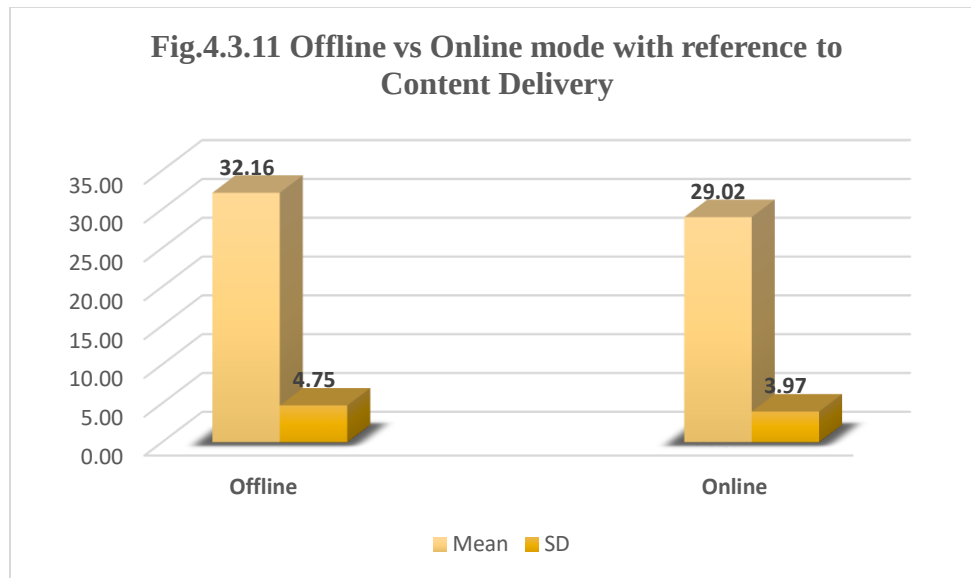


Table 4.3.11 and figures 4.3.11 given above shows the Mean and Standard Deviation of Offline teaching and Online teaching mode with reference to Content Delivery. The calculated Mean value of Offline teaching mode with reference to Content Delivery was 32.16 and its Standard Deviation was 4.75.

The calculated mean value of Online teaching mode with reference to Content delivery was 29.02 and its Standard Deviation was 3.97. The mean value of Offline teaching mode with reference to Content Delivery was higher than the Online teaching mode.

The Median value of Offline teaching mode a with reference to Content Delivery was 33 and the Mean value 32.16 thus distribution was negatively skewed. In Online teaching mode Median value was 29 and the mean value was 29.02. both the values are very close to each other therefore the distribution was more or less symmetrical in case of Online teaching mode.

The value of Kurtosis was for Offline teaching and Online teaching mode based on Content Delivery was -0.50 and 1.15 respectively. which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

4.3.12 To compare online teaching mode and offline teaching mode of Content Delivery on the basis of gender.

Table 4.3.12 Offline teaching mode vs Online teaching mode of Content Delivery based on gender							
Gender	Mode	N	Mean	Median	SD	Skew	Kurt
Male	Offline	46	30.65	31	5.23	-0.06	-0.96
	Online		30.04	29	4.26	0.28	-0.71
Female	Offline	153	32.61	33	4.51	-0.55	-0.20
	Online		28.71	29	3.81	-0.46	1.84

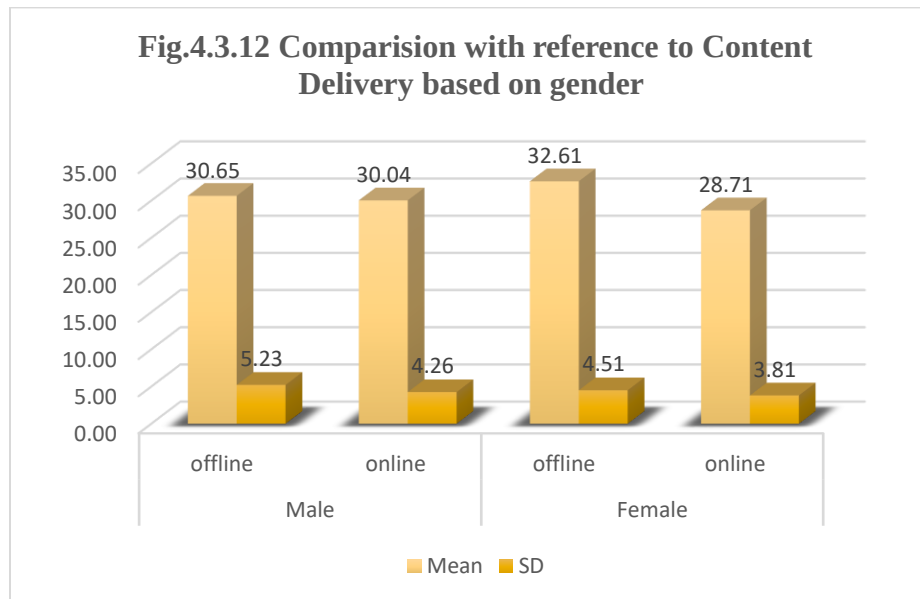


Table 4.3.12 and figure 4.3.12 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to Content Delivery based on gender.

The calculated Mean value of Male teachers in Offline teaching mode and Online teaching mode with reference to Content Delivery was 30.65 and 30.04 respectively and

its Standard Deviation was 5.23 and 4.26. The Mean value of Male teachers is higher in Offline teaching mode than the Online teaching mode

The calculated Mean value of female teachers in Offline teaching mode and Online teaching mode with reference to Content Delivery was 32.61 and 28.71 and its Standard Deviation was 4.51 and 3.81 respectively. The Mean value of Female teachers is higher in Offline teaching mode than the Online teaching mode

Median value of Male teachers in Offline teaching mode with reference to Content Delivery was 31 and the Mean value was 30.65 thus the distribution was negatively skewed. In case of Online teaching mode Median was 29 and the Mean value was 30.04 thus the distribution was positively skewed.

Median value of female teacher of Offline teaching mode and Online teaching mode with reference to Content Delivery was 33 and 29 and Mean value 32.61 and 28.71 was respectively, thus the distribution was negatively skewed.

The value of Kurtosis was in Offline and Online teaching mode with reference to Content Delivery based on male teachers was 0.96, and 0.71 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis was in Offline with reference to Content Delivery based on female teachers was -0.20 which was less than the normal distribution 0.263 thus the distribution was Leptokurtic. In case of Online teaching mode Kurtosis value was 1.84 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic

4.3.13 To compare online teaching mode and offline teaching mode of content delivery with reference to affiliated boards.

Table 4.3.13 Offline teaching mode vs Online teaching mode of Content Delivery based on affiliated boards.

Boards	Mode	N	Mean	Median	SD	Skew	Kurt
CBSE	Offline	59	32.42	33	4.71	-0.35	0.99
	Online		29.49	29	4.07	0.12	0.51
ICSE	Offline	7	32.14	32	3.80	-0.08	0.59
	Online		33.29	35	5.22	-0.96	0.79
SSC	Offline	133	32.04	33	4.83	-0.49	0.34
	Online		28.58	29	3.69	-0.60	1.95

Fig.4.3.12 Comparison with reference to Content Delivery based on affiliated boards

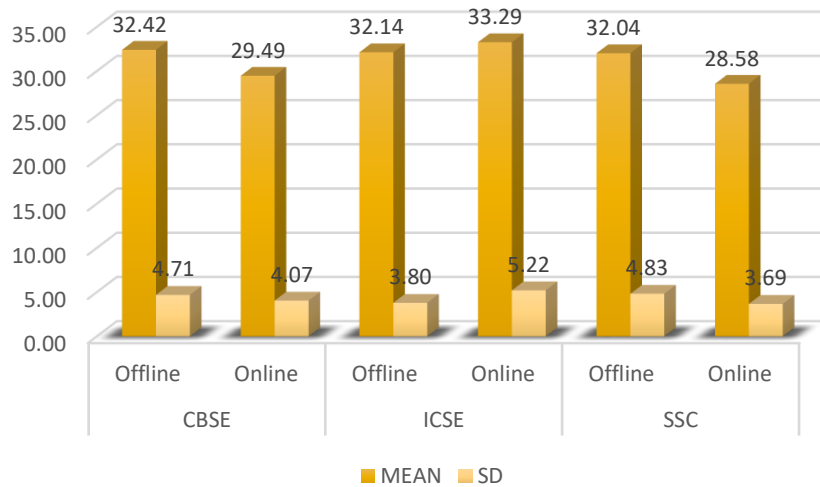


Table 4.3.13 and figures 4.3.13 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching with reference to Content Delivery based on affiliated boards.

The calculated Mean value of Offline teaching mode and Online teaching mode was 32.42,29.49 and its standard deviation was 4.71, 4.07 respectively with reference to Content Delivery based on CBSE board.

The Mean value of CBSE board with reference to Content Delivery in Offline teaching mode was higher than the Online teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode was 32.14,33.29 and its standard deviation was 3.80,5.22 respectively with reference to Content Delivery based on ICSE board.

The Mean value of ICSE board with reference to Content Delivery in Online teaching mode was higher than the Offline teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode was 32.04,28.58 and its standard deviation was 4.83, 3.69 respectively with reference to Content Delivery based on SSC board.

The Mean value of SSC board with reference to Content Delivery in Online teaching mode was higher than the Offline teaching mode.

The Median value of Offline teaching mode based on CBSE board was 33 and the Mean value was 32.42 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 29 and the Mean value was 29.5 both the values are very close to each other therefore the distribution was more or less symmetrical. Median value of Offline teaching mode and Online teaching mode with reference to Content Delivery based on ICSE board was 32,35 and Mean value 32.14,33.29 was respectively, thus the distribution was negatively skewed.

Median value of Offline teaching mode and Online teaching mode with reference to Content Delivery based on SSC board was 33, 29 and Mean value was 32.04, 28.58 respectively, thus the distribution was negatively skewed.

The Kurtosis value of Offline teaching mode and Online teaching mode with reference to Content Delivery based on CBSE board was -0.91, 0.51 respectively which was higher than the normal contribution 0.263 therefore both the distribution was Platykurtic.

The Kurtosis value of Offline teaching mode and Online teaching mode with reference to Content Delivery based on ICSE board was 0.50, -0.79 which was higher than the normal contribution 0.263 therefor the distribution was Platykurtic.

The Kurtosis value of Offline teaching mode with reference to Content Delivery based on SSC board was -0.34, 1.95 respectively which was higher than the normal contribution 0.263 therefore the distribution was Platykurtic.

4.3.14 To compare Offline teaching mode and online teaching mode of Content Delivery on the basis of teaching subjects.

Table 4.3.14 Offline teaching mode vs Online teaching mode based on Content Delivery with reference to teaching subjects							
Subjects	Mode of teaching	N	Mean	Median	SD	Skew	Kurt
Language	Offline	93	32.43	32	5.03	-0.50	0.25
	Online		28.60	28	3.90	-0.41	2.90
Mathematics	Offline	44	32.39	33.5	4.33	-0.65	0.59
	Online		30.18	30.5	3.88	-0.23	0.45
Science	Offline	36	32.17	33	4.80	-0.46	0.67
	Online		28.69	29	3.92	-0.38	0.01
Social science	Offline	26	30.77	32	4.30	-0.27	1.08
	Online		28.88	28	4.15	0.71	0.80

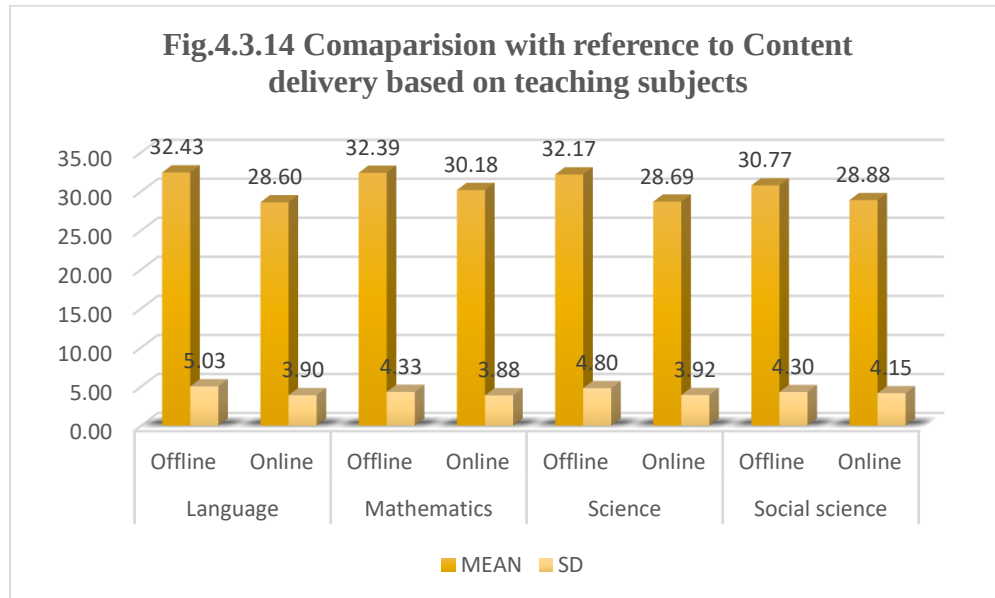


Table 4.3.14 and figure 4.3.14 given above shows the Mean and Standard deviation of Offline teaching mode and Online teaching mode with reference to Content Delivery based on teaching subjects. The calculated mean score of Offline teaching mode and Online teaching mode with reference to language was 32.43 and 28.60 and its Standard Deviation was 5.03, 3.90 respectively.

The Mean value of Language subject with reference to Content Delivery in Offline teaching mode was higher than the Online teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Mathematics was 32.39 and 30.18 and its Standard Deviation was 4.33, 3.88 respectively.

The Mean value of Mathematics subject with reference to Content Delivery in Offline teaching mode was higher than the Online teaching mode.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Science was 32.17 and 28.69 and its Standard Deviation was 4.80 & 3.92 respectively.

The Mean value of Science subject with reference to Content Delivery in Offline teaching mode was higher than the Online teaching mode. The calculated mean score of Offline teaching mode and Online teaching mode with reference to Social science was 30.77 and 28.88 and its Standard Deviation was 4.30 and 4.15 respectively. The Mean value of Social science subject with reference to Content Delivery in Offline teaching mode was higher than the Online teaching mode.

The Median value of Offline teaching mode and Online teaching mode with reference to Content Delivery based teaching subjects Language was 32 and 28 respectively and Mean value was 32.43 and 28.60 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode and Online teaching mode with reference to Content Delivery based teaching subjects Mathematics was 33.5 and 30.5 respectively and Mean value was 32.39 and 30.18 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode and Online teaching mode with reference to Content Delivery based teaching subjects Science was 33.29 respectively and Mean value was 32.17, 28.69 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode with reference to Content Delivery based teaching subject's Social science was 32 and Mean value was 30.77 thus the distribution was negatively skewed.

In case of Online teaching mode Median value was 28 and Mean value was 28.88 both the values are very close to each other therefore the distribution was more or less symmetrical.

The value of Kurtosis in Offline teaching mode with reference to Content Delivery based on Language subject was -0.25 which was almost same to the normal distribution 0.263 thus the distribution was Mesokurtic.

In case of Online teaching mode Kurtosis value was 2.90 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. The value of

Kurtosis in Offline teaching mode and Online teaching mode for Mathematics subject was -0.59, -0.45 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. The value of Kurtosis in Offline teaching mode for Science subject was -0.67 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value was 0.01 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for Social Science subject was -1.80, 0.80 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

4.3.15 To compare Offline teaching mode and Online teaching mode of content delivery based on experience.

Table 4.3.15 Offline teaching mode vs Online teaching mode based on Content Delivery with reference to experience							
Experience	Teaching mode	N	Mean	Median	SD	Skew	Kurt
3 to 5 years	Offline	46	31.74	32	4.39	-0.08	0.87
	Online		29.78	29	4.29	-0.14	0.06
6 to 10 years	Offline	44	32.25	34	4.89	-0.81	0.10
	Online		28.52	27.5	3.88	0.86	0.61
11 to 15 years	Offline	48	33.33	34.5	4.46	-0.45	0.74
	Online		29.13	29.5	3.77	0.09	0.08
20 years and above	Offline	61	31.48	32	5.05	-0.39	0.43
	Online		28.72	29	3.94	-1.32	3.98

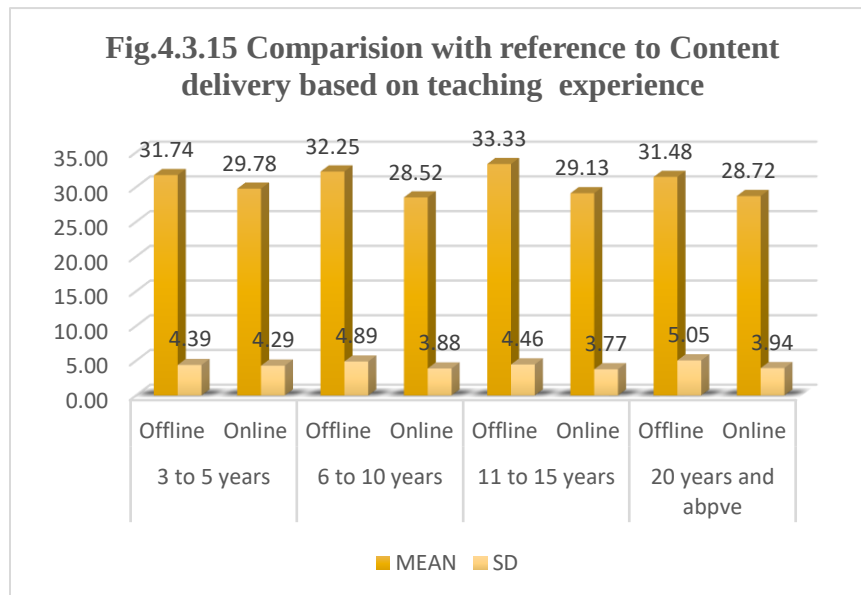


Table 4.3.15 and figure 4.3.15 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference Content Delivery based on teaching experience.

The calculated mean value in Offline and Online teaching mode of teachers with reference to Content Delivery based on teaching experience of 3 to 5 years was 31.74, 29.78 and its Standard Deviation was 4.39,4.29 respectively.

The Mean value of Offline teaching mode is higher than the Online teaching mode as per 3 to 5 years teachers teaching experience with reference to Content Delivery. The calculated mean value in Offline and Online teaching mode of teachers with 6 to 10 years' experience was 32.25,28.52 and its standard Deviation was 4.89,3.88 respectively.

The Mean value of Offline teaching mode is higher than the Online teaching mode as per 6 to 10 years' teachers teaching experience with reference to Content Delivery. The

calculated mean value in Offline and Online teaching mode of teachers with 11 to 15 years' experience was 32.25, 28.52 and its standard Deviation was 4.89, 3.88 respectively.

The Mean value of Offline teaching mode is higher than the Online teaching mode as per 11 to 15 years teachers teaching experience with reference to Content Delivery.

The calculated mean value in Offline and Online teaching mode of teachers with 20 years' and above experience was 31.48, 28.72 and its standard Deviation was 5.05, 3.94 respectively.

The Mean value of Offline teaching mode is higher than the Online teaching mode as per 20 years and above teachers teaching experience with reference to Content Delivery.

Median value of Offline and Online teaching mode with reference to Content Delivery based on teachers teaching experience of 3 to 5 years was 32 & 29 and Mean value was 31.74 & 29.78 thus the distribution was negatively skewed. Median value of Offline teaching mode with reference to Content Delivery based on teachers teaching experience of 6 to 10 years was 34 and Mean value was 32.25 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 27.5 and Mean value was 28.52 both the values are very close to each other therefore the distribution was more or less symmetrical.

Median value of Offline teaching mode with reference to Content Delivery based on teachers teaching experience of 11 to 15 years was 34.5 and Mean value was 33.33 thus the distribution was negatively skewed.

In case of Online teaching mode Median value was 29.5 and Mean value was 29.13 both the values are very close to each other therefore the distribution was more or less symmetrical.

Median value of Offline teaching mode and Online teaching mode with reference to Content delivery based on teachers teaching experience of 20 years and above was 32, 29

and Mean value was 31.48,28.72 respectively, thus the distribution was negatively skewed.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 3 to 5 years was -0.87 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value 0.06 respectively which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 6 to 10 years was -0.10 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

In case of Online teaching mode Kurtosis value 0.61 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 11 to 15 years was -0.74, which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value -0.08 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 20 years and above was -0.43, 3.98 respectively which was higher than the normal distribution 0.263 therefore both the distribution was Platykurtic.

4.3.16 To compare Offline mode and Online among the secondary school teacher with reference to classroom interaction.

Table 4.3.16 Offline teaching mode vs Online teaching mode with reference to Classroom Interaction							
Classroom Interaction	N	Mode	Mean	Median	SD	Skew	Kurt
Offline Mode of teaching	199	20	17.38	19	3.082	-0.83	-0.64
Online Mode of teaching	199	21	23.61	24	3.84	-0.09	0.10

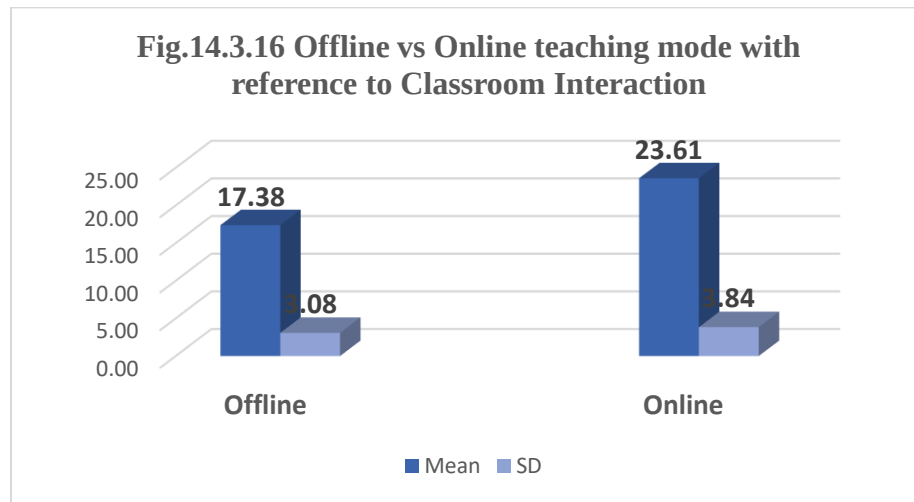


Table 4.3.16 and figures 4.3.16 given above shows the Mean and Standard Deviation of Offline teaching and Online teaching mode with reference to Classroom Interaction.

The calculated Mean value of Offline teaching mode with reference to Classroom Interaction was 17.38 and its Standard Deviation was 3.08.

The calculated mean value of Online teaching mode with reference to Classroom Interaction was 23.61 and its Standard Deviation was 3.84.

The mean value of Online teaching mode with reference to Classroom Interaction was higher than the Offline teaching mode.

The Median value of Offline teaching mode a with reference to Classroom Interaction was 19 which was significantly higher than the Mean value 17.38 therefore Distribution was negatively skewed.

In Online teaching mode Median and Mean value is almost same so skewness is negligible in Online teaching mode with reference to Classroom Interaction therefore the given distribution is more or less symmetrical in nature.

The value of kurtosis was for Offline based on Classroom Interaction was -0.64 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value 0.10 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

4.3.17 To compare Offline teaching mode and Online teaching mode of classroom interaction on the basis of gender.

Table 4.3.17 Offline teaching mode vs Online teaching mode of Classroom Interaction based on gender							
Gender	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Male	Offline	46	16.65	18	3.44	-0.61	0.88
	Online		23.74	23.5	4.02	-0.38	0.26
Female	Offline	153	17.60	19	2.94	-0.89	0.64
	Online		23.58	24	3.79	0.01	0.10

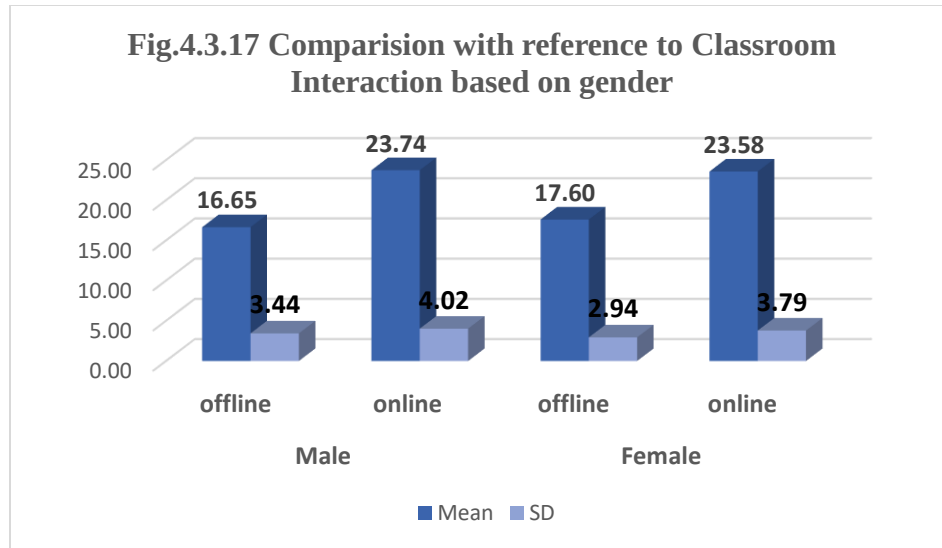


Table 4.3.17 and figure 4.3.17 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on gender.

The calculated Mean value of Male teachers in Offline teaching mode and Online teaching mode with reference to Classroom Interaction was 16.65 and 23.74 and its Standard Deviation was 3.44 and 4.02 respectively. The Mean value of male teachers in Online teaching mode with reference to Classroom Interaction was higher than the Offline teaching mode.

The calculated Mean value of female teachers in Offline teaching mode and Online teaching mode with reference to Classroom interaction was 17.60 and 23.58 and its Standard Deviation was 2.94 and 3.79 respectively. The Mean value of Female teachers in Online teaching mode with reference to Classroom Interaction was higher than the Offline teaching mode.

Median value of Male teachers in Offline teaching mode and Online teaching mode 18 and 23.5 which was significantly higher than the mean value 16.65, 23.74 respectively so both the distribution was negatively skewed.

Median value of female teachers in Offline teaching mode 19 which was significantly higher than the mean value is 17.60 so distribution was negatively skewed. In Online teaching mode Median value and Mean value of Female teachers is almost same so skewness is negligible therefore the given distribution is symmetrical in nature.

The value of Kurtosis was in Offline teaching mode with reference to Classroom Interaction based on male teachers was -0.88, which was higher than the normal distribution 0.263 thus the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.26 which was similar to normal distribution therefore the distribution was Mesokurtic.

The value of Kurtosis in Offline teaching mode with reference to Classroom Interaction based on female 0.64 which was higher than the normal distribution 0.263 thus the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.10 which was less than the normal distribution 0.263 thus the distribution was leptokurtic in Online teaching mode with reference to Classroom interaction based on Female teachers.

4.3.18 To compare Offline teaching mode and Online teaching mode of classroom interaction on the basis of affiliated boards.

Table 4.3.18 Offline teaching mode vs Online teaching mode of Classroom Interaction based on affiliated boards.							
Boards	Teaching mode	N	Mean	Median	SD	Skew	Kurt
CBSE	Offline	59	17.39	19	3.10	-0.81	0.82
	Online		23.92	23	3.60	0.40	0.28
ICSE	Offline	7	18.29	19	2.36	-1.33	0.48
	Online		24.86	26	4.30	-0.83	0.78
SSC	Offline	133	17.33	19	3.12	-0.83	0.60
	Online		23.41	23	3.93	-0.20	0.09

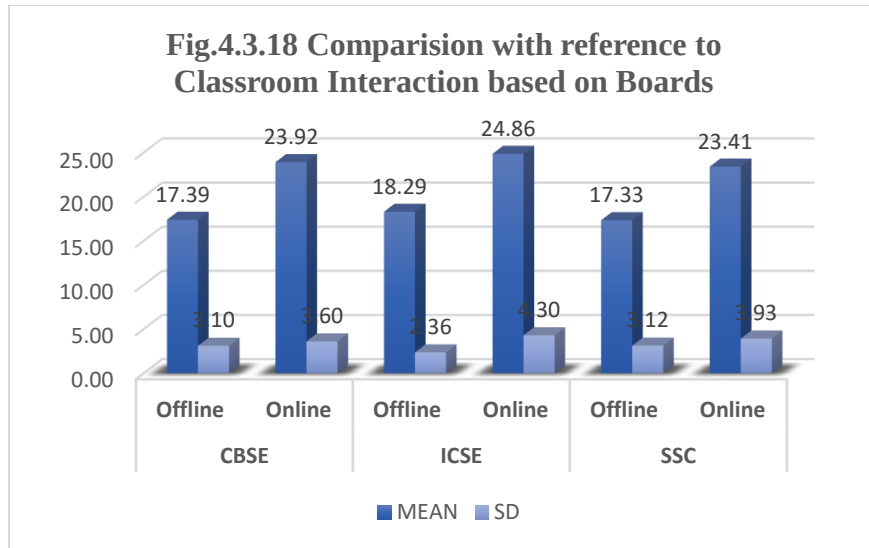


Table 4.3.18 and figures 4.3.18 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching with reference to Classroom Interaction based on affiliated boards.

The calculated Mean value of Offline teaching and Online teaching mode with reference to Classroom Interaction based on CBSE board was 17.39, 23.92 respectively. and its standard deviation was 3.10,3.60 respectively. The Mean Score of CBSE board with reference to Classroom Interaction was higher in Online teaching mode than Offline teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode was 18.29,24.86 and its standard deviation was 2.36,4.30 respectively with reference to Classroom Interaction based on ICSE board.

The Mean Score of ICSE board with reference to Classroom Interaction was higher in Online teaching mode than Offline teaching mode.

The calculated Mean value of Offline teaching mode and Online teaching mode was 17.33,23.41 and its standard deviation was 3.12, 3.93 respectively with reference to Classroom Interaction based on SSC board. The Mean Score of SSC board with reference

to Classroom Interaction was higher in Online teaching mode than Offline teaching mode.

The Median value of Offline teaching mode based on CBSE board was 19 and the Mean value was 17.39 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 23 and the Mean value was 23.92 thus the distribution was positively skewed.

Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on ICSE board was 19,26 and Mean value was 18.29, 24.86 respectively, thus the distribution was negatively skewed. Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on SSC board was 19,23 and Mean value was 17.33,23.41 respectively, thus the distribution was negatively skewed.

The Kurtosis value of Offline teaching mode with reference to Classroom Interaction based on CBSE board was -0.82 which was higher than the normal contribution 0.263 therefor the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.28 which was very close to the normal contribution 0.263 therefore the distribution was more or less Mesokurtic.

The Kurtosis value of Offline teaching mode with reference to Classroom Interaction based on ICSE board was 0.48, -0.78 respectively which was higher than the normal contribution 0.263 therefore both the distribution was Platykurtic.

The Kurtosis value of Offline teaching mode with reference to Classroom Interaction based on SSC board was -0.60, which was higher than the normal contribution 0.263 therefore the distribution was Platykurtic.

In case of Online teaching mode Kurtosis value was 0.09 which was less than the normal contribution 0.263 therefor the distribution was Leptokurtic.

4.3.19 To compare online teaching mode and offline teaching mode of classroom interaction on the basis of subjects.

Table 4.3.19 Offline teaching mode vs Online teaching mode based on Classroom Interaction with reference to subjects							
Subjects	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Language	Offline	93	17.62	19	2.97	-1.06	0.15
	Online		23.12	23	3.69	-0.43	0.004
Mathematics	Offline	44	18.05	20	2.73	-1.19	0.05
	Online		24.61	24.5	3.41	0.27	0.50
Science	Offline	36	16.53	18	3.58	-0.36	1.65
	Online		23.67	24	4.05	-0.31	0.25
Social Science	Offline	26	16.58	16.5	3.06	-0.35	1.19
	Online		23.62	23	4.58	0.66	0.48

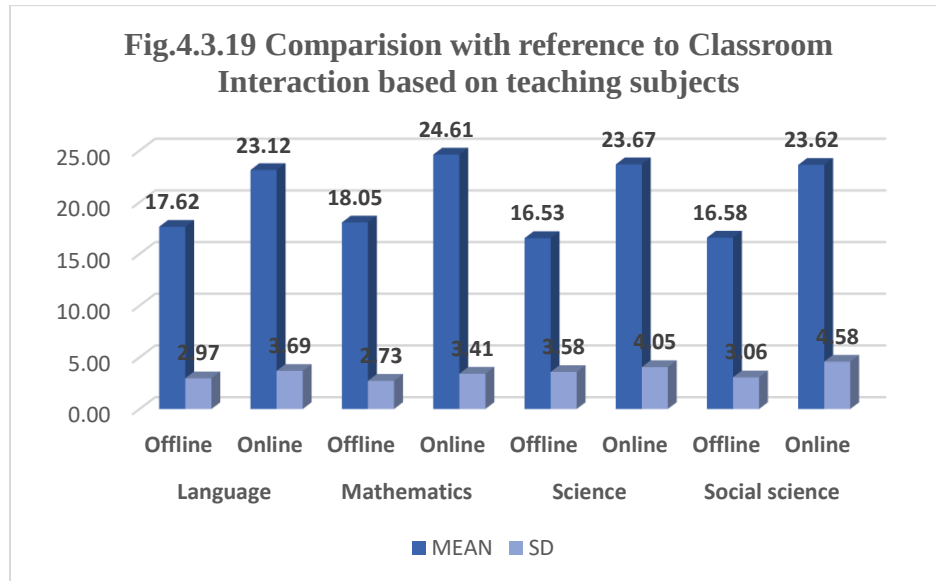


Table 4.3.19 and figure 4.3.19 given above shows the Mean and Standard deviation of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on teaching subjects. The calculated mean score of Offline teaching mode and Online teaching mode with reference to language was 17.62 and 23.12 and its Standard Deviation was 2.97&3.69 respectively. The Mean score of Language subject in Online teaching mode was higher than the Offline teaching mode with reference to Classroom Interaction.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Mathematics was 18.05 and 24.61 and its Standard Deviation was 2.73&3.41 respectively. The Mean score of Mathematics subject in Online teaching mode was higher than the Offline teaching mode with reference to Classroom Interaction.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Science was 16.53 and 23.67 and its Standard Deviation was 3.58&4.05 respectively. The Mean score of Science subject in Online teaching mode was higher than the Offline teaching mode with reference to Classroom Interaction.

The calculated mean score of Offline teaching mode and Online teaching mode with reference to Social science was 16.58 and 23.62 and its Standard Deviation was 3.06&4.58 respectively. The Mean score of Social science subject in Online teaching mode was higher than the Offline teaching mode with reference to Classroom Interaction.

The Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based teaching subjects Language was 19 & 23 respectively and Mean value was 17.62 & 23.12 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode with reference to Classroom Interaction based teaching subjects Mathematics was 20 and Mean value was 18.05 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 24.5 and Mean value was 24.67 .

The Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based teaching subjects Science was 18 & 24 respectively and Mean value was 16.53 & 23.67 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode with reference to Classroom Interaction based teaching subject's Social science was 16.5 and Mean value was 16.58 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 23 and Mean value was 23.62 both the values are very close to each other therefore the distribution was more or less symmetrical.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to Classroom Interaction on Language subject was 0.15, 0.004 which was less than the normal distribution 0.263 thus the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode for Mathematics subject was -0.05, which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic. In case of Online teaching mode Kurtosis value 0.50 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for Science subject was -1.65 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.25 respectively which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for Social Science subject was 1.19 & 0.48 respectively, which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

4.3.20 To compare Offline teaching mode and Online teaching mode of Classroom Interaction on the basis of experience.

Table 4.3.20 Offline teaching mode vs Online teaching mode based on Classroom Interaction with reference to experience							
Experience	Mode	N	Mean	Median	SD	Skew	Kurt
3 to 5 years	Offline	46	16.96	18	3.21	-0.51	1.29
	Online		23.72	24	4.09	-0.33	0.01
6 to 10 years	Offline	44	17.09	18	3.31	-0.96	0.07
	Online		23.66	23	4.20	0.55	0.02
11 to 15 years	Offline	48	18.5	20	2.39	-1.63	1.51
	Online		22.96	23	3.54	-0.05	0.21
20 years and above	Offline	61	17.03	18	3.16	-0.52	1.29
	Online		24.02	24	3.63	-0.61	0.99

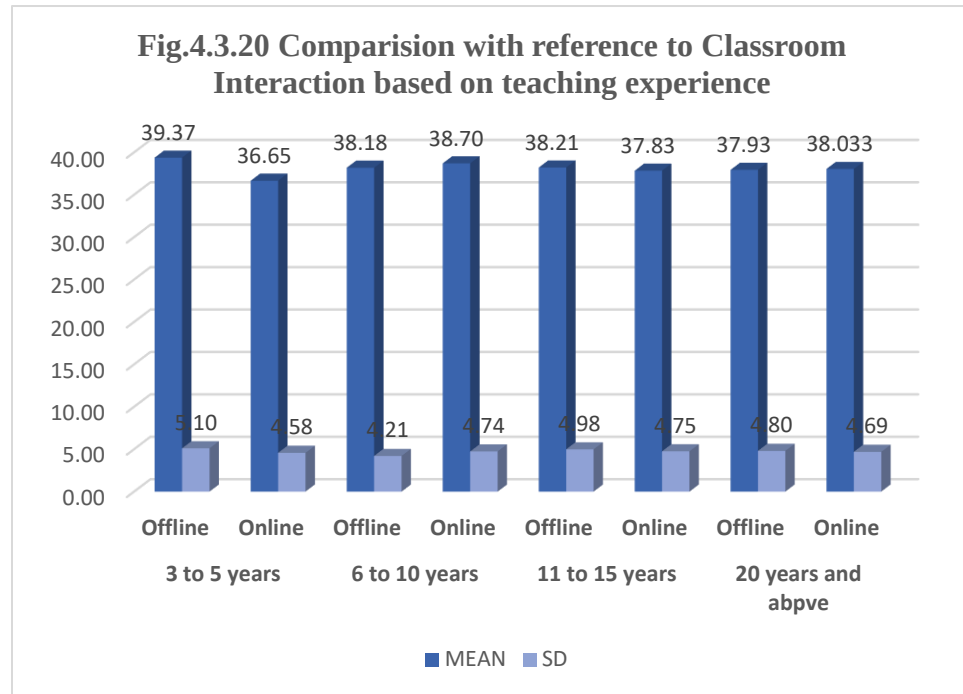


Table 4.3.20 and figure 4.3.20 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference Classroom Interaction based on teaching experience.

The calculated mean value in Offline and Online teaching mode of teachers with reference to Classroom Interaction based on teaching experience of 3 to 5 years was 39.37 & 36.65 and its Standard Deviation was 5.10 & 4.58 respectively. The mean score of Offline teaching mode with reference to Classroom Interaction based on teacher teaching experience 3 to 5 years was higher than the Online teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 6 to 10 years' experience was 38.18, 38.70 and its standard Deviation was 4.21 & 4.74 respectively.

The mean score of Online teaching mode with reference to Classroom Interaction based on teacher teaching experience 6 to 10 years was higher than the Offline teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 11 to 15 years' experience was 38.21 & 37.83 and its standard Deviation was 4.98 & 4.74 respectively.

The mean score of Offline teaching mode with reference to Classroom Interaction based on teacher teaching experience 11 to 15 years was higher than the Online teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 20 years' and above experience was 37.93 & 38.03 and its standard Deviation was 4.80 & 4.69 respectively. The mean score of Online teaching mode with reference to Classroom Interaction based on teacher teaching experience 20 years and above was higher than the Offline teaching mode.

Median value of Offline and Online teaching mode with reference to Classroom Interaction based on teachers teaching experience of 3 to 5 years was 18 & 24 and Mean value was 16.96 & 23.72 thus the distribution was negatively skewed.

Median value of Offline teaching mode with reference to Classroom Interaction based on teachers teaching experience of 6 to 10 years was 18 and Mean value was 17.09 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 23 and Mean value was 23.66 both the values are very close to each other therefore the distribution was more or less symmetrical.

Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on teachers teaching experience of 11 to 15 years was 20 & 23 and Mean value was 18.5 & 22.96 respectively thus the distribution was negatively skewed.

Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on teachers teaching experience of 20 years and above was 18 & 24 and Mean value was 17.03 & 24.02 respectively thus the distribution was negatively skewed.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 3 to 5 years was -1.29, which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis value was 0.01 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 6 to 10 years was 0.07 & 0.02 respectively which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 11 to 15 years was 1.51 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. In case of Online teaching mode Kurtosis

value was 0.21 which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 20 years and above was 1.29 & 0.99 respectively which was higher than the normal distribution 0.263 therefore both the distribution was Platykurtic.

4.3.21 To compare Offline mode and Online mode of teaching among the secondary school teacher with reference to Student Assessments.

Table 4.3.21 Offline teaching mode vs Online teaching mode with reference to Student Assessment.							
Student Assessment	N	Mode	Mean	Median	SD	Skew	Kurt
Offline	199	30	24.14	25	4.25	-0.41	0.56
Online	199	18	18.53	18	3.66	0.21	0.61

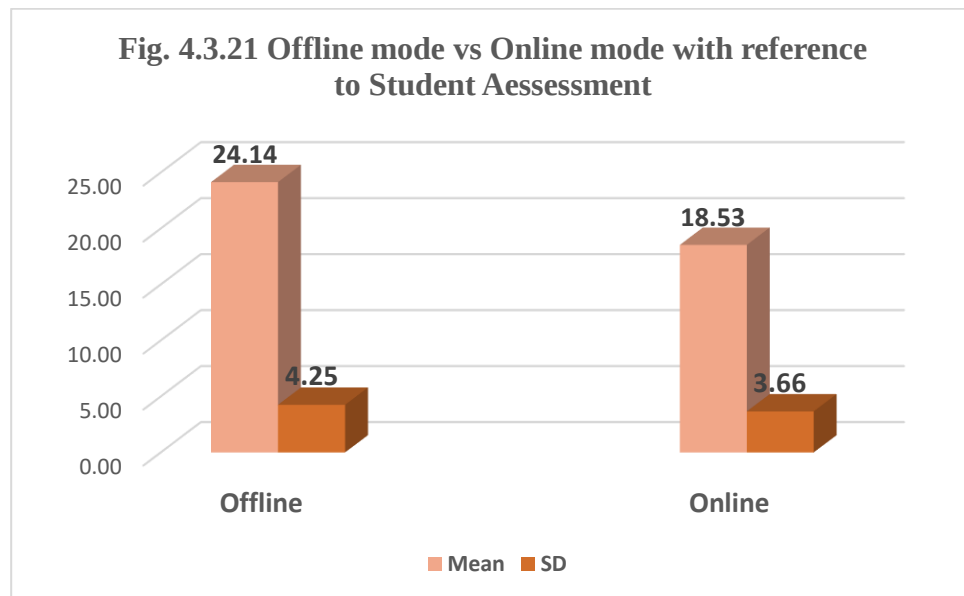


Table 4.3.21 and figures 4.3.21 given above shows the Mean and Standard Deviation of Offline teaching and Online teaching mode with reference to Student Assessment.

The calculated Mean value of Offline teaching mode with reference to Student Assessment was 24.14 and its Standard Deviation was 4.25. The calculated mean value of Online teaching mode with reference to Student Assessment was 18.53 and its Standard Deviation was 3.66. The mean value of Offline teaching mode with reference to Student Assessment was higher than the Online teaching mode.

The Median value of Offline teaching mode a with reference to Student Assessment was 25 which was significantly higher than the Mean value 24.14 therefore skewness is negative. In Online teaching mode Mean Mode and Median and value is almost same so skewness is negligible in Online teaching mode with reference to Student Assessment therefore the given distribution is symmetrical in nature. The value of kurtosis was for Offline and Online teaching mode based on Classroom Interaction was -0.56 and 0.61 respectively. which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

4.3.22 To compare Offline teaching mode and Online teaching mode of Student Assessment based on gender.

Table 4.3.21 Offline teaching mode vs Online teaching mode of Student Assessment based on gender							
Gender	Mode of teaching	N	Mean	Median	SD	Skew	Kur
Male	Offline	46	23	24	4.15	-0.22	0.48
	Online		18.98	19	2.66	-0.20	0.60
Female	Offline	153	24.48	25	4.23	-0.49	0.49
	Online		18.40	18	3.91	0.30	0.52

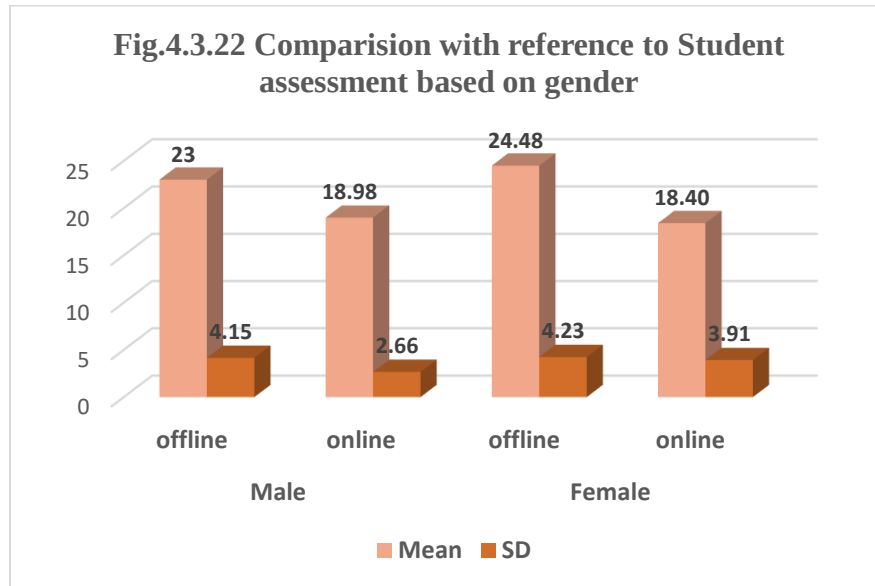


Table 4.3.22 and figure 4.3.22 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to Student Assessment 24.48 and Assessment based on gender. The calculated Mean value of Male teachers in Offline teaching mode and Online teaching mode with reference to Student Assessment was 23 and 18.98 and its Standard Deviation was 4.15 and 2.66 respectively. The Mean score of Offline teaching mode with reference to Student Assessment based on male teachers was higher than the Online teaching mode. The calculated Mean value of female teachers in Offline teaching mode and Online teaching mode with reference to Student Assessment was 24.48 and 18.40 and its Standard Deviation was 4.23 and 3.91 respectively.

The Mean score of Offline teaching mode with reference to Student Assessment based on female teachers was higher than the Online teaching mode.

Median value of Male teachers in Offline teaching mode and Online teaching mode 24 and 19 which was significantly higher than the mean value 23 & 18.98 therefore the distribution was negatively skewed. Median value of female teachers in Offline teaching mode 25 which was significantly higher than the mean value is 24.48 so distribution was

negatively skewed. In Online teaching mode Median value 25 and Mean value 24.58 of Female teachers both the value was very close therefore the given distribution was more or less symmetrical in nature.

The value of Kurtosis in Offline teaching mode and Online teaching mode of male teachers was 0.48, & 0.60 respectively which was higher than the normal distribution 0.263 thus the distribution was platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to Student Assessment based of female teachers 0.49 and 0.52 which was higher than the normal distribution 0.263 thus the distribution was platykurtic.

4.3.23 To compare Offline teaching mode and Online teaching mode of student Assessment on the basis of affiliated boards.

Table 4.3.23 Offline teaching mode vs Online teaching mode of Student Assessment based on boards.							
Boards	Teaching mode	N	Mean	Median	SD	Skew	Kurt
CBSE	Offline	59	24.75	25	3.83	-0.58	0.15
	Online		18.59	18	3.25	0.20	0.28
ICSE	Offline	7	23.71	24	3.82	-0.22	2.51
	Online		19.86	21	3.58	-1.30	1.54
SSC	Offline	133	23.89	24	4.45	-0.33	0.71
	Online		18.44	19	3.85	0.27	0.73

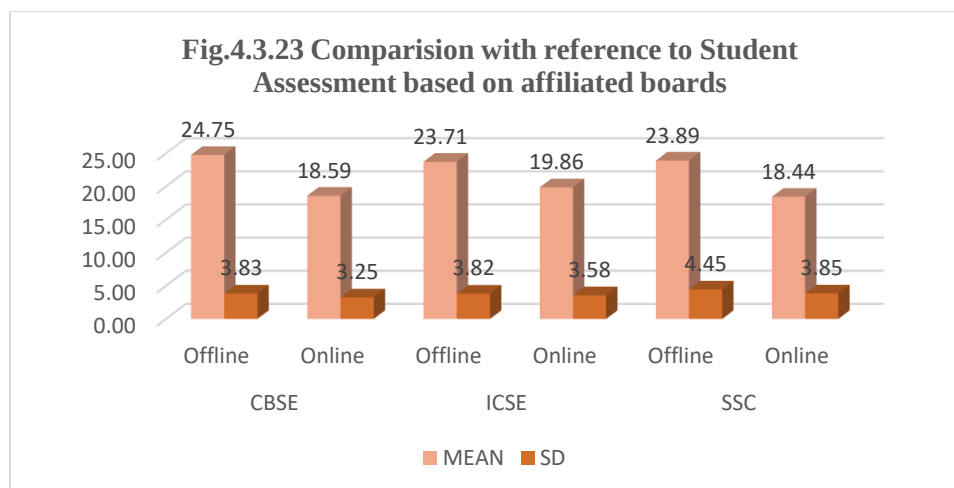


Table 4.3.23 and figures 4.3.23 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching with reference to Student Assessment based on affiliated boards.

The calculated Mean value of Offline teaching and Online teaching mode with reference to Classroom Interaction based on CBSE board was 24.75 & 18.59 respectively. and its standard deviation was 3.83 & 3.25 respectively.

The calculated Mean value of Offline teaching mode and Online teaching mode was 18.29&24.86 and its standard deviation was 2.36 & 4.30 respectively with reference to Student Assessment based on ICSE board.

The calculated Mean value of Offline teaching mode and Online teaching mode was 23.89&18.44 and its standard deviation was 4.45&3.85respectively with reference to Student Assessments based on SSC board.

The Mean value was significantly higher in Offline teaching mode with reference to Student Assessments based on affiliated boards.

The Median value of Offline teaching mode based on CBSE board was 25 and the Mean value was 24.75 thus the distribution was negatively skewed.

In case of Online teaching mode Median value was 18 and the Mean value was 18.59 thus the distribution was positively skewed. Median value of Offline teaching mode and Online teaching mode with reference to Student Assessments based on ICSE board was 24 & 21 and Mean value was 23.71 & 19.86 respectively, thus the distribution was negatively skewed.

Median value of Offline teaching mode with reference to Student Assessment based on SSC board was 24 and Mean value was 23.89, thus the distribution was negatively skewed.

In case of Online teaching mode Median value was 19 and Mean value was 18.44 thus the distribution was positively skewed.

The Kurtosis value of Offline teaching mode with reference to Student Assessment based on CBSE board was 0.15 which was less than the normal contribution 0.263 therefore the distribution was Leptokurtic.

In case of Online teaching mode Kurtosis value was 0.28 which was very close to the normal contribution 0.263 therefore the distribution was more or less Mesokurtic. The Kurtosis value of Offline teaching mode and Online teaching mode with reference to Student Assessment based on ICSE board was 0.51 and 1.54 respectively which was higher than the normal contribution 0.263 therefore the distribution was Platykurtic.

The Kurtosis value of Offline teaching mode and Online teaching mode with reference to Student Assessments based on SSC board was -0.71 which was less than the normal contribution 0.263 therefore the distribution was Leptokurtic.

In case of Online teaching mode Kurtosis value was 0.73 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

4.3.24 To compare Offline teaching mode and Online teaching mode of Student Assessment on the basis of teaching subjects.

Table 4.3.24 Offline teaching mode vs Online teaching mode with reference to Student Assessment based on teaching subjects.							
Subjects	Teaching mode	N	Mean	Median	SD	Skew	Kurt
Language	Offline	93	23.91	24	4.42	-0.38	0.54
	Online		18.76	19	3.54	0.55	0.72
Mathematics	Offline	44	25.09	26	3.61	-0.45	0.55
	Online		18	18	3.26	-0.11	0.91
Science	Offline	36	24.06	25	4.94	-0.38	1.02
	Online		19.11	19	3.29	0.15	1.09
Social science	Offline	26	23.46	24	3.51	-0.40	0.13
	Online		17.81	18	5.01	0.14	0.21

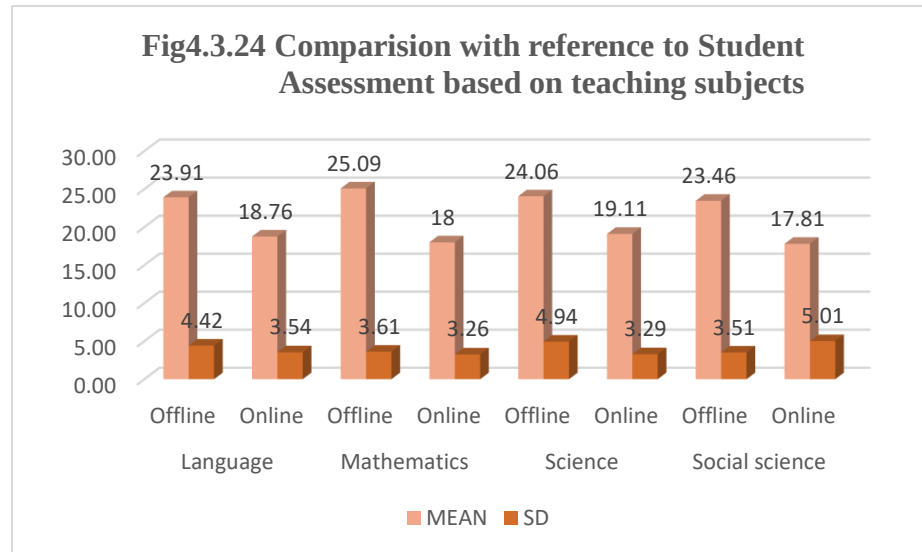


Table 4.3.24 and figure 4.3.24 given above shows the Mean and Standard deviation of Offline teaching mode and Online teaching mode with reference to Student Assessment based on teaching subjects. The calculated mean score of Offline teaching mode and Online teaching mode with reference to language was 23.91 and 18.76 and its Standard Deviation was 4.42 & 3.54 respectively. The calculated mean score of Offline teaching mode and Online teaching mode with reference to Mathematics was 25.09, and 18 and its Standard Deviation was 3.61&3.26 respectively. The calculated mean score of Offline teaching mode and Online teaching mode with reference to Science was 24.06 and 19.11 and its Standard Deviation was 4.94 &3.29 respectively. The calculated mean score of Offline teaching mode and Online teaching mode with reference to Social science was 23.46 &17.81 and its Standard Deviation was 3.51,5.01 respectively. The Mean score of Offline teaching mode was higher than the Online teaching mode with reference to teaching subjects.

The Median value of Offline teaching mode with reference to Student Assessment teaching subjects Language was 24 respectively and Mean value was 23.91 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 19, and Mean value was 18.76 both the value was very close therefore the distribution was more or less symmetrical.

The Median value of Offline teaching mode and Online teaching mode with reference to Student Assessment based teaching subjects Mathematics was 26 &18 respectively and Mean value was 25.09 & 18 respectively thus the distribution was negatively skewed.

The Median value of Offline teaching mode with reference to Student Assessment based teaching subjects Science was 25 and Mean value was 24.06 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 19, and Mean value was 19.11 thus the distribution was positively skewed

The Median value of Offline teaching mode with reference to Student Assessment based teaching subject's Social science was 24 and Mean value was 23.46 thus the distribution

was negatively skewed. In case of Online teaching mode Median value was 18 and Mean value was 17.81 thus the distribution was positively skewed.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to Student Assessment in Language subject was 0.54 & 0.72 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for Mathematics subject was 0.55 and 0.91. which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic. The value of Kurtosis in Offline teaching mode and Online teaching mode for Science subject was 1.02 & 1.09 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode for Social Science subject was 0.13 & 0.21 respectively which was less than the normal distribution 0.263 therefore both the distribution was Leptokurtic.

4.3.25 To compare Offline teaching mode and Online teaching mode of Student Assessment on the basis of teaching experience.

Table 4.3.25 Offline teaching mode vs Online teaching mode based on Student Assessment with reference to teaching experience							
Experience	Teaching mode	N	Mean	Median	SD	Skew	Kurt
3 to 5 years	Offline	46	24.59	25	4.35	-0.43	0.66
	Online		19.61	19	3.53	0.51	1.04
6 to 10 years	Offline	44	24.20	25	4.75	-0.66	0.48
	Online		18.89	19	3.62	0.25	1.65
11 to 15 years	Offline	48	24.90	25	3.89	-0.51	0.15
	Online		17.90	18	3.74	-0.06	0.37
20 years and above	Offline	61	23.16	23	3.98	-0.13	0.53
	Online		17.97	18	3.61	0.30	0.73

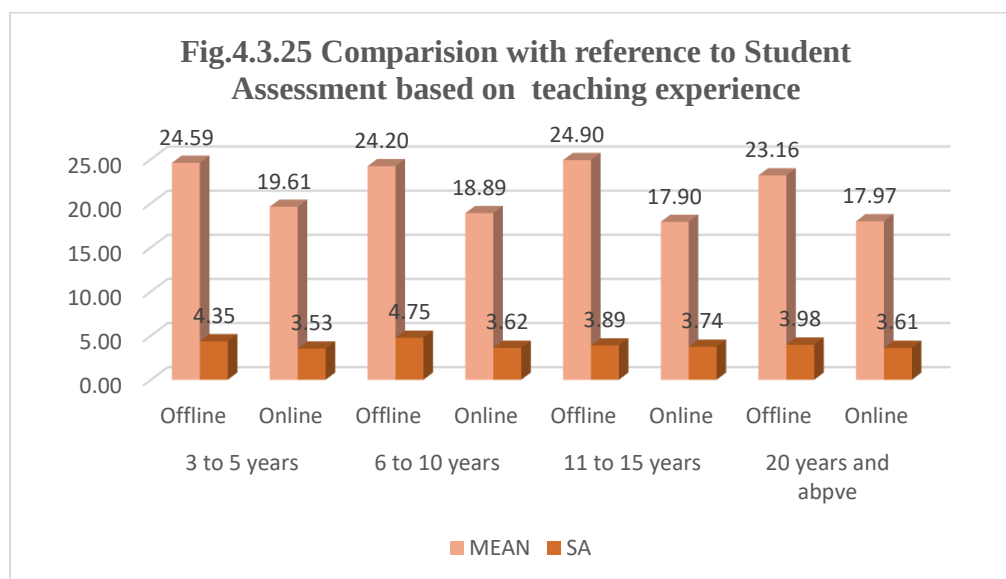


Table 4.3.25 and figure 4.3.25 given above shows the Mean and Standard Deviation of Offline teaching mode and Online teaching mode with reference to Student assessments based on teaching experience.

The calculated mean value in Offline and Online teaching mode of teachers with reference to Student Assessments based on teaching experience of 3 to 5 years was 24.59 & 19.61 and its Standard Deviation was 4.35 & 3.53 respectively. The mean score of Online teaching mode with reference to Student Assessment based on 3 to 5 teaching experience of teachers was higher than the Offline teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 6 to 10 years' experience was 24.20 & 18.89 and its standard Deviation was 4.75 & 3.62 respectively. The mean score of Online teaching mode with reference to Student Assessment based on 6 to 10 teaching experience of teachers was higher than the Offline teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 11 to 15 years' experience was 24.90 & 17.90 and its standard Deviation was 3.89 & 3.74 respectively. The mean score of Offline teaching mode with reference to Student Assessment based on 11 to 15 teaching experience of teachers was higher than the Online teaching mode.

The calculated mean value in Offline and Online teaching mode of teachers with 20 years' and above experience was 23.16 & 17.97 and its standard Deviation was 3.98 & 3.61 respectively. The mean score of Offline teaching mode with reference to Student Assessment based on 20 years and above teaching experience of teachers was higher than the Online teaching mode.

Median value of Offline with reference to Student Assessment based on teachers teaching experience of 3 to 5 years was 25 and Mean value was 24.59 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 19 and Mean value was 19.61 thus the distribution was positively skewed.

Median value of Offline teaching mode with reference to Student Assessments based on teachers teaching experience of 6 to 10 years was 25 and Mean value was 24.20 thus the distribution was negatively skewed. In case of Online teaching mode Median value was 19 and Mean value was 18.89 both the values were very close to each other therefore distribution was more or less symmetrical.

Median value of Offline teaching mode and Online teaching mode with reference to Classroom Interaction based on teachers teaching experience of 11 to 15 years was 25 & 18 and Mean value was 24.90 & 17.90 respectively thus the distribution was negatively skewed.

Median value of Offline teaching mode with reference to Student Assessment based on teachers teaching experience of 20 years and above was 23 and Mean value was 23.16. Both the values were very close to each other therefore distribution was more or less symmetrical. In case of Online teaching mode Median value was 18 and Mean value

was 17.97 both the values was very close to each other therefore distribution was more or less symmetrical.

The value of Kurtosis in Offline teaching mode and Offline teaching mode with reference to teachers teaching experience of 3 to 5 years was 0.66 & 1.65 respectively which was higher than the normal distribution 0.263 therefore both the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode and Online teaching mode with reference to teachers teaching experience of 6 to 10 years was 0.48 & 1.65 respectively which was higher than the normal distribution 0.263 therefore both the distribution was Platykurtic.

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 11 to 15 years was 0.15, which was less than the normal distribution 0.263 therefore the distribution was Leptokurtic. In case of Online teaching mode Kurtosis value was 0.37 which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic

The value of Kurtosis in Offline teaching mode with reference to teachers teaching experience of 20 years and above was 0.53 & 0.73 respectively which was higher than the normal distribution 0.263 therefore the distribution was Platykurtic with reference to Student Assessment based teaching experience of 20 years and above.

4.4 Conclusion: The descriptive analysis presents the facts of the sample. It determines the result in the form frequency distribution tables and graph. Thus it allows the researcher to infer the outcome in an explicit manner. The analysis done above were based on the objectives and hence the researcher could represent tabular and graphical representations in more suitable manner.

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Chapter 5

INFERENCEAL ANALYSIS

5.1 Introduction:

Inferential statistics are mathematical methods that employ probability theory for deducing(inferring), the property for a population from the analysis of the properties of data sample drawn from it. Inferential statistics helps to reach conclusions that extend beyond the descriptive data analysis. It is employed to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance during the study. Therefore, inferential analysis focuses on precision and reliability of the inferences. It helps to draw by analyzing the data.

Inferential statistical also called inductive statistics fall into one of two categories test for difference of mean and test for statistical significance, the later one further subdivided into parametric and non-parametric statistics. Parametric tests assume that the data are normally or nearly normally distributed some of the popular parametric test used are t-test, the analysis of variance and Pearson correlation coefficient.

In inferential statistics, the null hypothesis usually refers to general statement or default position that there is no relationship or no statistical difference between two measured phenomena, Or no difference among groups. The researcher tries to disapprove, reject or nullify the null hypothesis. Statistical significance is the number, called a p-value which tells the probability of the result being observed, given that a certain statement (the null hypothesis) is true. If the p-value is sufficiently small the experimenter can safely assume that the null hypothesis is false.

5.2 Inferential statistical measures:

The steps of inferential analysis can be summarized as follows:

1. Establishment of a null hypothesis.
2. Choosing a suitable level of significance, 5 % or 1 %.
3. Determining the Standard error of the difference between means of two samples.
4. Determining the standard score value in terms of t.
5. Determining the critical value of t from the normal curve for the computed value of degrees of freedom.
6. If the computed value of t in the given problem reaches the critical value t, then it is to be taken as significant, and consequently the null hypothesis stands rejected. If this, fall short of the critical value, the null hypothesis is not rejected.
7. When we are interested only in knowing the magnitude of the difference between means, a two tailed test is employed but in case the direction is also needed, then one tailed test is used. If the null hypothesis is rejected, we say that the difference found in the sample means is trustworthy and real. But if the null hypothesis is accepted, we have to conclude that the difference between the means is not real; it may occur by chance or due to sampling fluctuations.

The null hypothesis: One of the most important elements of any study is the formulation of research hypothesis as it directs us towards the intend of the study. There are statements that narrow the purpose statement into specific predictions about the relationship among variables. For the present study, null hypothesis (H_0) was framed.

Setting up the level of significance: The researcher must decide about the level of confidence or significance at which the hypotheses are going to be tested. It can be either at 0.05 or 5% level or more rigid level i.e., 0.01 or 1% level of confidence. When hypothesis is rejected at 0.05 or 5% level of significance, it is said that the chances are 1 out of 100 that the hypothesis is not true and only 5 chances out of 100 that it is true. When hypothesis is rejected at 0.01 or 1% significance than the chances are 99 out of 100

that the hypothesis is not true and that only one chance out of 100 is true. For this study significance level adopted was 0.05.

To test the null hypothesis of the present study **t-test** is used as statistical technique which is considered as an appropriate test for judging the significance of the sample mean or for judging the significance between the Means of two samples in case of small sample when population variance is not known, the independent sample t-test is used when two separate sets for independent and identically distributed samples are obtained, one from each of the two populations being compared the formula for t-test is :

$$t = \frac{(M_1 - M_2)}{\sigma_D} = \frac{(\text{Difference between means})}{(\text{Standard error of difference between means})}$$

Where standard error of difference is calculated by using the formula:

$$SE_D \text{ or } \sigma_D = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

we refer to the table to t-distribution which gives the critical values based on the calculated degree of freedom. No of degree of freedom is calculated by using the formula:

$$df = (N_1 + N_2) - 2$$

Analysis of variance: A composite procedure for testing simultaneously the difference between several sample mean is known as *analysis variance*. It helps us to know whether any of difference between the means of the given sample are significant.

If the answer is yes, we examine the pairs (with the help of t-test) where the significance lies. If the answer is 'no' we do not proceed further. Variance is simply the arithmetic average of the squared deviation from their means.

Variance has a quality which makes it especially useful. It has an additive property, which the Standard deviation with its square root does not possess.

Hence the term ‘analysis variance’ deals with the task of analyzing of breaking up the total variance of a large sample or a population consisting of a few equal groups or sub sample in to two groups. (two kind of variance)

1. “*Within groups*” variance. This is average variance of the members of each group means. i.e. the mean value of the scores in a sample (as members of each group may vary among themselves).
2. “*Between group variance*. This represents the variance of group means around the total or grand mean of all groups, i.e., the best estimate of the population means (as the group means may vary considerably from each other).

In this way the technique of analysis variance as a single composite test of significance, for the difference between several group means demands the derivation of two independent estimates of the population variance and the other on average (variance within the groups variance.)

Ultimately, the comparison of the size of between groups variance and within groups variance called F-ratio denoted by:

$$\frac{\text{Between-groups variance}}{\text{Within-groups variance}}$$

is used as critical ratio for determining the significance of the difference between group means at a given level of significance.

5.3 Inferential analysis of the present data:

5.3.1 There is no significant difference between the Offline teaching mode and Online teaching mode as perceived by the secondary school teacher.

Table 5.3.1 Offline teaching mode vs Online teaching mode with reference to secondary school teachers.

Teaching mode	N	df	[M ₁ - M ₂]	SE _D	t-value	Level of significance	H ₀ Accepted/ Rejected.
						$\alpha = 0.05$ /0.01	
Offline	398	396	4.69	1.21	3.88	S**	Rejected
Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of the teachers is 3.88 which is more than the critical t-value 1.97 at 0.05 level and also more than the critical value 2.58 at 0.01 level.
- The mean difference between offline teaching and online teaching mode is significant at 0.01 (1%) level of significance. Hence the null hypothesis that population t is zero is rejected at 0.01 level and we can consider the obtained value of t as trustworthy and significant. Therefore, the null hypothesis was rejected.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers.

5.3.2 There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to gender.

Table 5.3.2 Offline vs Online based on gender								
Gender	Teaching mode	N	df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
Male	Offline	92	90	6.87	2.65	2.59	S*	Rejected
	Online							
Female	Offline	306	304	4.04	1.36	2.97	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to male teachers was 2.59 with df = 90 is more than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Male teachers was rejected at 0.05 level of significance.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to female teachers was 2.97 with df = 304 is more than table t- value 1.97 at 0.05 level and 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and Online teaching mode with reference to female teachers was rejected at 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the schoolteachers on the basis of gender.

5.3.3 There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated boards.

Table No 5.3.2.a ANOVA result of affiliated boards.

<i>Source of Variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	2577.865	5	515.5729	3.59	0.003453	2.24
Within Groups	56269.63	392	143.545			
Total	58847.5	397				

- The calculated 'F' value was 3.59 which is more than the 'F' table value 2.24 at 0.05 level of significance and 3.08 at 0.01 level of significance. Since the F value was significant with respect to the affiliated boards, hence the researcher applied 't' test for further analysis.

Table 5.3.2b Offline vs Online based on affiliated boards

Boards	Teaching mode	N	df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
CBSE	Offline	118	116	8.44	2.27	3.71	S**	Rejected
	Online							
ICSE	Offline	14	12	2	5.94	0.37	NS	Accepted
	Online							
SSC	Offline	266	264	3.18	2.18	2.04	S*	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from CBSE board was 3.71. with $df = 116$ is more than table t- value 1.98 at 0.05 level and more than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to CBSE teachers was rejected at 0.05 and also 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers on the basis affiliated CBSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from ICSE board was 0.37 with $df = 12$ is less than table t- value 2.18 at 0.05 level and less than table t-value 3.06 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to ICSE teachers was accepted at 0.05 and 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers on the basis affiliated ICSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from SSC board was 2.04 with $df = 264$ is more than table t- value 1.97 at 0.05 level and less than table t-value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to SSC teachers was rejected at 0.05 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers on the basis affiliated SSC board.

5.3.4 There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to teaching subjects.

Table No 5.3.4.a ANOVA result of teaching subjects.

<i>Source of Variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	4282.96	7	611.8514	4.37	0.00011	2.03
Within Groups	54564.54	390	139.9091			
Total	58847.5	397				

The calculated 'F' value was 4.37 which is more than the 'F' table value 2.03 at 0.05 level of significance and 2.84 at 0.01 level of significance. Since the F value was significant with respect to the teaching subject, hence the researcher applied 't' test for further analysis.

Table 5.3.4b Offline vs Online based on teaching subject								
Teaching subjects	Teaching mode	N	df	M₁-M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
Language	Offline	186	184	1.09	3.18	0.34	NS	Accepted
	Online							
Mathematics	Offline	88	86	4.91	2.39	2.05	S*	Rejected
	Online							
Science	Offline	72	70	11.52	1.92	2.71	S*	Rejected
	Online							
Social Science	Offline	52	50	7.85	3.57	2.19	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Language subject was 0.34 with $df = 184$ is less than table t- value 1.97 at 0.05 level and less than table t-value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Language teaching subject was accepted at 0.05 and 0.01 levels of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers on the basis of Language teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Mathematics subject was 2.05 with $df = 86$ is more than table t- value 1.99 at 0.05 level and less than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Mathematics teaching subject was rejected at 0.05 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the schoolteachers on the basis of mathematics teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Science subject was 2.71 with $df = 70$ is more than table t- value 2.00 at 0.05 level and more than table t-value at 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Science teaching subject is rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the schoolteachers on the basis of Science teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Social science subject was 2.19 with $df = 50$ is more than table t- value 2.01 at 0.05 level and less than table t-value at 2.68 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Social science teaching subject was rejected at 0.05 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the schoolteachers on the basis of Social Science teaching subjects.

5.3.5 There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to experience.

Table No 5.3.5 an ANOVA result of teaching experience.

<i>Source of Variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3170.314	7	452.902	3.17	0.002821	2.03
Within Groups	55677.18	390	142.762			
Total	58847.5	397				

- The calculated 'F' value was 3.17 which is more than the 'F' table value 2.03 at 0.05 level of significance and 2.68 at 0.01 level of significance. Since the F value was significant with respect to the teaching experience, hence the researcher applied 't' test for further analysis.

Table 5.3.5b Offline vs Online based on teaching experience								
Teaching experience	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
3 to 5 years	Offline	92	90	3.9	2.48	1.57	NS	Accepted
	Online							
6 to 10 years	Offline	88	86	4.59	2.88	1.59	NS	Accepted
	Online							
11 to 15 years	Offline	296	294	4.5	2.51	1.79	NS	Accepted
	Online							
20 years and above	Offline	122	120	2.97	1.96	1.51	NS	Accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 3 to 5 years teaching experience was 1.57 with df = 90 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 3 to 5 years teaching experience was accepted at 0.05and 0.01 level.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 6 to 10 years teaching experience was 1.59 with df = 86 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 6 to 10 years teaching experience was accepted at 0.05 and 0.01 level.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 11 to 15 years teaching experience was 1.79 with df = 296 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 11 to 15 years teaching experience was accepted at 0.05 and 0.01.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 20 years and above teaching experience was 1.51 with df = 122 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 20 years and above teaching experience was accepted at 0.05 and 0.01 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers on the basis of Teaching experiences.

5.3.6 There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to classroom preparation.

Table 5.3.6a Offline teaching mode vs Online teaching mode with reference to Classroom Preparation.							
Teaching mode	N	df	[M₁- M₂]	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
						$\alpha = 0.05/0.01$	
Offline	398	396	0.98	0.48	2.04	S*	Rejected
Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of the teachers is 2.04 which is more than the critical t-value 1.97 at 0.05 level and less than the critical value 2.59 at 0.01 level of significance.
- Hence the null hypothesis is significant at 0.05 (5%) level of significance. The hypothesis that population t is zero is rejected at 0.05 level and we can consider the obtained value of t as trustworthy and significant at 0.05level of significance.
- There is significant difference in the Offline teaching mode and Online teaching mode with reference to classroom preparation as perceived by the secondary school teachers.

5.3.7 There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of gender.

Table 5.3.7 Offline vs Online with reference to classroom preparation based on gender								
Gender	Teaching mode	N	df	M₁ - M₂	SE_D	t- value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
Male	Offline	92	90	0.63	1.01	0.62	NS	Accepted
	Online							
Female	Offline	306	304	0.56	0.52	1.07	NS	Accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to male teachers was 0.62 with df = 90 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and

online teaching mode with reference to Classroom preparation based on Male teachers was accepted at 0.05 level of significance.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to female teachers was 1.07 with $df = 304$ is less than table t- value 1.97 at 0.05 level and 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and Online teaching mode with reference to Classroom preparation based on female teachers was accepted at 0.05 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of gender.

5.3.8 There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of boards.

Table 5.3.8a Offline vs Online with reference to classroom preparation based on affiliated boards								
Boards	Teaching mode	N	df	M₁ - M₂	SE_D	t- value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
CBSE	Offline	118	116	1.66	0.61	2.72	S**	rejected
	Online							
ICSE	Offline	14	12	2.43	1.48	1.64	NS	accepted
	Online							
SSC	Offline	266	264	0.01	0.59	0.01	NS	accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from CBSE board with reference to classroom preparation was 2.72 with $df = 116$ is more than table t- value 1.98 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation from CBSE teachers was rejected at 0.05 and also 0.01 a level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of CBSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom preparation from ICSE board teacher was 1.64 with $df = 12$ is less than table t- value 2.14 at 0.05 level and less than table t-value at 3.06 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation of ICSE teachers was accepted at 0.05 and 0.01 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of ICSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from SSC board was 0.01 with $df = 264$ is less than table t- value 1.97 at 0.05 level and less than table t-value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation from SSC teachers was accepted at 0.05 and 0.01 levels of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of SSC board.

5.3.9 There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of subjects

Table 5.3.9a Offline vs Online with reference to classroom preparation based on teaching subject								
Teaching subjects	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
Language	Offline	186	184	0.86	0.64	1.34	NS	Accepted
	Online							
Mathematics	Offline	88	86	1.11	1.12	0.99	NS	Accepted
	Online							
Science	Offline	72	70	2.53	1.20	2.11	S*	Rejected
	Online							
Social Science	Offline	52	50	0.3	1.36	0.22	NS	Accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Language subject was 1.34 with df = 184 is less than table t- value 1.98 at 0.05 level and less than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation for Language teaching subject was accepted at 0.05 and 0.01 levels of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of Language teaching subjects.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers for Mathematics subject was 0.99 with $df = 86$ is less than table t- value 1.99 at 0.05 level and less than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation for Mathematics teaching subject was accepted at 0.05 and 0.01 level.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of Mathematics teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference classroom preparation to teachers for Science teaching subject was 2.11 with $df = 70$ is more than table t- value 2.00 at 0.05 level and less than table t-value at 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom preparation for Science teaching subject was rejected at 0.05.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of Science teaching subject.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom preparation of teachers for Social science teaching subject was 0.22 with $df = 50$ is less than table t- value 2.01 at 0.05 level and less than table t-value at 2.68 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Social science teaching subject was accepted at 0.05 and 0.01 levels of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of Social Science teaching subject.

5.3.10 There is no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of experience.

Table 5.3.10a Offline vs Online with reference to classroom preparation based on teaching experience								
Teaching Experience	Teaching mode	N	df	M₁-M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
3 to 5 years	Offline	92	90	2.72	1.01	2.69	S*	Rejected
	Online							
6 to 10 years	Offline	88	86	3.73	0.94	3.96	S**	Rejected
	Online							
11 to 15 years	Offline	296	294	0.38	0.99	0.38	NS	Accepted
	Online							
20 years and above	Offline	122	120	0.1	0.86	0.12	NS	Accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 3 to 5 years teaching experience was 2.69 with df = 90 is more than table t- value 1.99 at 0.05 level and more than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 3 to 5 years teaching experience was rejected at 0.05and 0.01 significance level.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of 3 to 5 years teaching experience.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 6 to 10 years teaching experience was 3.96 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 6 to 10 years teaching experience was rejected at 0.05 and 0.01 significance level.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of 6 to 10 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 11 to 15 years teaching experience was 0.38 with $df = 296$ is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 11 to 15 years teaching experience was accepted at 0.05 and 0.01 significance levels.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of 11 to 15 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 20 years and above teaching experience was 0.12 with $df = 122$ is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.62 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to 20 years and above teaching experience was accepted at 0.05 and 0.01 significance level.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Classroom preparation on the basis of 20 years and above teaching experience.

5.3.11 There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to content delivery.

Table 5.3.6a Offline teaching mode vs Online teaching mode with reference to Content Delivery.							
Teaching mode	N	df	[M₁- M₂]	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
						α = 0.05/0.01	
Offline	398	396	3.14	0.43	7.30	S**	Rejected
Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of the teachers with reference to content delivery is 7.30 which is more than the critical t-value 1.97 at 0.05 level and also more than the critical value 2.58 at 0.01 level.
- Hence the null hypothesis is significant at 0.01 (1%) level of significance. The hypothesis that population t is zero was rejected at 0.01 level and we can consider the obtained value of t as trustworthy and significant.
- There is a significant difference in the Offline teaching mode and Online teaching mode with reference to content delivery as perceived by the secondary school teachers.

5.3.12 There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of gender.

Table 5.3.7 Offline vs Online with reference to content delivery based on gender								
Gender	Teaching mode	N	Df	M₁ -M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
Male	Offline	92	90	0.61	0.99	0.61	NS	Accepted
	Online							
Female	Offline	306	304	3.9	0.48	8.12	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of male teachers with reference to content delivery was 0.61 with df = 90 is less than table t- value 1.99 at 0.05 level and less than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Content delivery based on Male teachers was accepted at 0.05 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of male teachers.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to female teachers was 8.12 with df = 304 is more than table t- value 1.97 at 0.05 level and 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and Online teaching mode with reference to Content delivery based on female teachers was rejected at 0.05 level and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of female teachers.

5.3.13 There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of affiliated boards.

Table 5.3.13a Offline vs Online with reference to content delivery based on affiliated boards

Boards	Teaching mode	N	df	M ₁ -M ₂	SE _D	t-value	Level of significance	H ₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
CBSE	Offline	118	116	2.93	0.81	3.62	S**	Rejected
	Online							
ICSE	Offline	14	12	1.15	2.43	0.47	NS	Accepted
	Online							
SSC	Offline	266	264	3.46	0.52	6.65	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from CBSE board based on content delivery was 3.62 with df = 116 is more than table t- value 1.98 at 0.05 level and more than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery from CBSE teachers was rejected at 0.05 and also 0.01 level of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of CBSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from ICSE board based on content delivery was 0.47 with $df = 12$ is less than table t- value 2.14 at 0.05 level and less than table t-value 3.06 at 0.01 level hence the null hypothesis, there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery of ICSE board teachers was accepted at 0.05 and 0.01 levels of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of ICSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from SSC board was 6.65 with $df = 264$ is more than table t-value 1.97 at 0.05 level and more than table t-value at 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery from SSC board teachers was rejected at 0.05 and 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of SSC board.

5.3.14 There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of teaching subjects.

Table 5.3.14a Offline vs Online with reference to content delivery based on teaching subject

Teaching subjects	Teaching mode	N	df	M ₁ - M ₂	SE _D	t-value	Level of significance	H ₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
Language	Offline	186	184	3.83	0.65	5.89	S**	Rejected
	Online							
Maths	Offline	88	86	3.48	0.88	3.95	S**	Rejected
	Online							
Science	Offline	72	70	2.21	1.02	2.16	S**	Rejected
	Online							
Social science	Offline	52	50	1.89	1.17	1.61	S**	Accepted
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery of teachers for Language subject was 5.89 with df = 184 is more than table t- value 1.97 at 0.05 level and more than table t-value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between

offline teaching mode and online teaching mode with reference to content delivery for Language teaching subject was rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of Language teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery of teachers for Mathematics subject was 3.95 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value at 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery for Mathematics teaching subject was rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of Mathematics teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery of teachers for Science teaching subject was 2.16 with $df = 70$ is more than table t- value 2.00 at 0.05 level and less than table t-value at 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery for Science teaching subject was rejected at 0.05 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of Science teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery to teachers for Social science teaching subject was 0.22 with $df = 50$ is less than table t- value 2.01 at 0.05 level and less than table t-

value at 2.68 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery of Social science teaching subject was accepted at 0.05 and 0.01 levels of significance.

- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of Social science teaching subjects.

5.3.15 There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of experience.

Table 5.3.15a Offline vs Online with reference to content delivery based on teaching experience								
Teaching experience	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
3 to 5 years	Offline	92	90	1.96	0.90	2.18	S**	Rejected
	Online							
6 to 10 years	Offline	88	86	4.2	0.93	4.51	S**	Rejected
	Online							
11 to 15 years	Offline	296	294	3.73	0.88	4.23	S**	Rejected
	Online							
20 years and above	Offline	122	120	3.94	0.81	4.86	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 3 to 5 years teaching experience was 2.18 with $df = 90$ is more than table t- value 1.99 at 0.05 level and less than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery based on 3 to 5 years teaching experience was rejected at 0.05 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of 3 to 5 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 6 to 10 years teaching experience was 4.51 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery of 6 to 10 years teaching experience is rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of 6 to 10 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery of 11 to 15 years teaching experience was 4.23 with $df = 296$ is more than table t- value 1.97 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to

content delivery of 11 to 15 years teaching experience was rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of 11 to 15 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 20 years and above teaching experience was 4.86 with $df = 122$ is more than table t- value 1.98 at 0.05 level and more than table t-value 2.62 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to content delivery based on 20 years and above teaching experience is rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the school teachers with reference to Content delivery on the basis of 20 years and above teaching experience.

5.3.16 There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to classroom interaction.

Table 5.3.16 a Offline teaching mode vs Online teaching mode with reference to Classroom Interaction.							
Teaching mode	N	df	[M ₁ -M ₂]	SE _D	t-value	Level of significance	H ₀ Accepted/ Rejected
						$\alpha = 0.05$	
Offline	398	396	6.23	0.35	17.8	S**	Rejected
Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of the teachers with reference to classroom interaction is 17.8 which is more than the critical t-value 1.97 at 0.05 level and also more than the critical value 2.59 at 0.01 level of significance.
- Hence the null hypothesis is significant at 0.01 (1%) level of significance. The hypothesis that population t is zero is rejected at 0.01 level and we can consider the obtained value of t as trustworthy and significant.
- There is a significant difference in the Offline teaching mode and Online teaching mode with reference to classroom interaction as perceived by the secondary school teachers.

5.3.17 There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of gender.

Table 5.3.17 Offline vs Online with reference to classroom interaction based on gender								
Gender	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
Male	Offline	92	90	7.09	0.78	9.08	S**	Rejected
	Online							
Female	Offline	306	304	5.98	0.38	15.73	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction was 9.08 with df = 90 is less than table t- value 1.99 at 0.05 level and less than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and

online teaching mode with reference to Classroom interaction based on Male teachers was rejected at 0.05 and also at 0.01 levels of significance.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to female teachers was 8.12 with $df = 304$ is more than table t- value 1.97 at 0.05 level and 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and Online teaching mode with reference to Classroom interaction based on female teachers was rejected at 0.05 level and also at 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of male teachers.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of female teachers.

5.3.18 There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of affiliated boards.

Table 5.3.18a Offline vs Online with reference to classroom interaction based on affiliated boards								
Boards	Teaching mode	N	Df	M₁ - M₂	SE_D	t- value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
CBSE	Offline	118	116	6.53	0.56	11.66	S**	Rejected
	Online							
ICSE	Offline	14	12	6.57	1.85	3.55	S**	Rejected
	Online							
SSC	Offline	266	264	6.08	0.19	32	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from CBSE board based on classroom interaction was 11.32 with $df = 116$ is more than table t- value 1.98 at 0.05 level and more than table t- value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction from CBSE teachers was rejected at 0.05 and also 0.01 a levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of CBSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from ICSE board based on classroom interaction was 3.55 with $df = 12$ is more than table t- value 2.18 at 0.05 level and more than table t- value 3.06 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction of ICSE board teachers was rejected at 0.05 and 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of ICSE board.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from SSC board was 32 with $df = 264$ is more than table t- value 1.97 at 0.05 level and less than table t-value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and

online teaching mode with reference to classroom interaction from SSC board teachers was rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of SSC board.

5.3.19 There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of teaching subjects.

Table 5.3.19 a Offline vs Online with reference to classroom interaction based on teaching subject								
Teaching subjects	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
Teaching subjects	Offline	186	184	5.5	0.49	11.22	S**	Rejected
	Online							
Maths	Offline	88	86	6.56	0.65	10.09	S**	Rejected
	Online							
Science	Offline	72	70	7.14	0.9	7.93	S**	Rejected
	Online							
Social science	Offline	52	50	7.04	1.07	6.58	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction of teachers for Language subject was 11.22 with df = 184 is more than table t- value 1.97 at 0.05 level and more than table t-

value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction for Language teaching subject was rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of Language teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to content delivery of teachers for Mathematics subject was 10.09 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction for Mathematics teaching subject was rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of Mathematics teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction of teachers for Science teaching subject was 7.93 with $df = 70$ is more than table t- value 2.00 at 0.05 level and more than table t-value 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction for Science teaching subject was rejected at 0.05 and also 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of Science teaching subjects.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction to teachers for Social science teaching subject

was 6.58 with $df = 50$ is more than table t - value 2.01 at 0.05 level and more than table t -value at 2.68 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Classroom interaction of Social Science teaching subject is rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of Social Science teaching subject.

5.3.20 There is no significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of experience.

Table 5.3.20 a Offline vs Online with reference to classroom interaction based on teaching experience								
Teaching Experience	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05$	
3 to 5 years	Offline	92	90	6.76	0.76	8.89	S**	Rejected
	Online							
6 to 10 years	Offline	88	86	6.57	0.81	8.11	S**	Rejected
	Online							
11 to 15 years	Offline	296	294	4.46	0.61	7.31	S**	Rejected
	Online							
20 years and above	Offline	122	120	6.99	0.61	11.45	S**	Rejected
	Online							

- The obtained t - value of Offline teaching mode and Online teaching mode with reference to teachers of 3 to 5 years teaching experience was 8.89 with $df = 90$ is more than table t - value 1.99 at 0.05 level and more than table t -value 2.63 at

0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction based on 3 to 5 years teaching experience was rejected at 0.05 and also 0.01 levels of significance.

- There is significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of 3 to 5 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 6 to 10 years teaching experience was 8.11 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction of 6 to 10 years teaching experience was rejected at 0.05 and 0.01 levels of significance.
- There is significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of 6 to 10 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction of 11 to 15 years teaching experience was 7.31 with $df = 296$ is more than table t- value 1.97 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction of 11 to 15 years teaching experience was rejected at 0.05 and also at 0.01 level of significance.
- There is significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of 11 to 15 years teaching experience.

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to classroom interaction of 20 years and above teaching experience was 11.45 with $df = 122$ is more than table t- value 1.98 at 0.05 level and more than table t-value 2.62 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to classroom interaction based on 20 years and above teaching experience was rejected at 0.05 and also at 0.01 levels of significance.
- There is significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Classroom interaction on the basis of 20 years and above teaching experience.

5.3.21 There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to student's Assessment.

Table 5.3.21a Offline teaching mode vs Online teaching mode with reference to Student Assessment.							
Teaching mode	N	df	[M₁- M₂]	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
						$\alpha = 0.05$	
Offline	398	396	5.61	0.4	14.02	S**	Rejected
Online							

- The obtained t- value of Offline teaching mode and Online teaching mode of the teachers with reference to classroom interaction is 14.02 which is more than the critical t-value 1.97 at 0.05 level and also more than the critical value 2.59 at 0.01 level.

- Hence the null hypothesis is significant at 0.01 (1%) level of significance. The hypothesis that population t is zero was rejected at 0.01 level and we can consider the obtained value of t as trustworthy and significant.
- There is a significant difference in the Offline teaching mode and Online teaching mode with reference to Student Assessment as perceived by the secondary school teachers.

5.3.22 There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of gender.

Table 5.3.22 Offline vs Online with reference to classroom interaction based on gender								
Gender	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05$	
Male	Offline	92	90	4.02	0.72	5.58	S**	Rejected
	Online							
Female	Offline	306	304	6.08	0.45	13.51	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student Assessment was 5.58 with df = 90 is more than table t- value 1.99 at 0.05 level and more than table t-value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment based on Male teachers was rejected at 0.05 and also 0.01 levels of significance.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to female teachers was 13.51 with df = 304 is more than table t- value 1.97 at 0.05 level and 2.59 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and Online teaching mode

with reference to Student Assessment based on female teachers was rejected at 0.05 level and 0.01 level of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of male teachers.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of female teachers.

5.3.23 There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of affiliated boards.

Table 5.3.23a Offline vs Online with reference to Student Assessment based on affiliated boards								
Boards	Teaching mode	N	Df	M₁ - M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
CBSE	Offline	118	116	6.16	0.65	9.48	S**	Rejected
	Online							
ICSE	Offline	14	12	3.85	1.99	1.93	S**	Accepted
	Online							
SSC	Offline	266	264	5.45	0.50	10.9	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers from CBSE board based on Student assessment was 9.48

with $df = 116$ is more than table t - value 1.98 at 0.05 level and more than table t -value at 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student assessment from CBSE teachers is rejected at 0.05 and also 0.01 a level of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of CBSE board.
- The obtained t - value of Offline teaching mode and Online teaching mode with reference to teachers from ICSE board based on Student assessment was 1.93 with $df = 12$ is less than table t - value 2.14 at 0.05 level and less than table t -value 3.06 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment of ICSE board teachers is accepted at 0.05 and 0.01 level of significance.
- There is no significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis ICSE board.
- The obtained t - value of Offline teaching mode and Online teaching mode with reference to teachers from SSC board was 10.9 with $df = 264$ is more than table t -value 1.97 at 0.05 level and more than table t -value at 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment from SSC board teachers was rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of SSC board.

5.3.24 There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of teaching subjects.

Table 5.3.19 a Offline vs Online with reference to Student Assessment based on teaching subject								
Teaching subjects	Teaching mode	N	Df	M₁ -M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							$\alpha = 0.05/0.01$	
Language	Offline	186	184	5.15	0.58	8.87	S**	Rejected
	Online							
Maths	Offline	88	86	7.09	0.5	14.18	S**	Rejected
	Online							
Science	Offline	72	70	4.95	0.63	7.85	S**	Rejected
	Online							
Social science	Offline	52	50	5.65	0.63	8.96	S**	Rejected
	Online							

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student assessment based on Language teaching subject was 8.87 with df = 184 is more than table t- value 1.97 at 0.05 level and more than table t- value 2.60 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment based on Language teaching subject was rejected at 0.05 and 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of Language teaching subjects

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student Assessment based on Mathematics subject was 14.18 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student assessment based on Mathematics teaching subject was rejected at 0.05 and 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of Mathematics teaching subjects
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student Assessment of teachers for Science teaching subject was 7.85 with $df = 70$ is more than table t- value 2.00 at 0.05 level and more than table t-value at 2.65 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment based on Science teaching subject was rejected at 0.05 and also 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of Science teaching subjects
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student assessment based on Social science teaching subject was 8.96 with $df = 50$ is more than table t- value 2.01 at 0.05 level and more than table t-value 2.68 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student assessment of Social Science teaching subject was rejected at 0.05 and 0.01 levels of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of Social Science teaching subjects.

5.3.25 There is no significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of experience.

Table 5.3.25 a Offline vs Online with reference to Student Assessment based on teaching experience								
Teaching experience	Teaching mode	N	Df	M₁-M₂	SE_D	t-value	Level of significance	H₀ Accepted/ Rejected
							α = 0.05/0.01	
3 to 5 years	Offline	92	90	4.98	0.82	6.07	S**	Rejected
	Online							
6 to 10 years	Offline	88	86	5.31	0.9	5.9	S**	Rejected
	Online							
11 to 15 years	Offline	29	294	7	0.77	9.09	S**	Rejected
	Online	6						
20 years and above	Offline	12	120	5.19	0.47	11.0	S**	Rejected
	Online	2				4		

- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 3 to 5 years teaching experience was 6.07 with df = 90 is more than table t- value 1.99 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student

assessment based on 3 to 5 years teaching experience was rejected at 0.05 and also 0.01 level of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of 3 to 5 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to teachers of 6 to 10 years teaching experience was 5.9 with $df = 86$ is more than table t- value 1.99 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student assessment 6 to 10 years teaching experience was rejected at 0.05 and 0.01 level of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of 6 to 10 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student assessment of 11 to 15 years teaching experience was 9.09 with $df = 296$ is more than table t- value 1.97 at 0.05 level and more than table t-value 2.63 at 0.01 level hence the null hypothesis there is no significant difference between offline teaching mode and online teaching mode with reference to Student Assessment based on 11 to 15 years teaching experience was rejected at 0.05 and also at 0.01 levels of significance.
- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of 11 to 15 years teaching experience.
- The obtained t- value of Offline teaching mode and Online teaching mode with reference to Student assessment based on 20 years and above teaching experience was 11.04 with $df = 122$ is more than table t- value 1.98 at 0.05 level and more than table t-value at 2.62 at 0.01 level hence the null hypothesis there is no

significant difference between offline teaching mode and online teaching mode with reference to Student assessment based on 20 years and above teaching experience was rejected at 0.05 and also at 0.01 level of significance.

- There is a significant difference in the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers with reference to Student Assessment on the basis of 20 years and above teaching experience.

5.4 Conclusion:

After testing the hypothesis using ANOVA and t-test, the researcher was able to drive the result and draw conclusion with respect to the study. Through the major findings and interpretation presented in the next chapter, the researcher has attempted to give meaning to the study.

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Chapter 6

SUMMARY AND CONCLUSION

6.1 Introduction:

“The only person who is educated is the one who has learned how to learn and change”.

Carl rogers

Change is the only thing that remains constant. Pandemic has created lots of change in all the sectors. This is especially true in education sector. Therefore, everything in this universe appears to be outdated with any innovation or growth, and wisdom lies in the capacity to respond to change. Change is continual and irreversible. Online teaching mode is primarily referred to as the use of technology and network communication for teaching and learning. A technology-enabled transfer of skills and information to a wide number of recipients is often referred to as (Economic Times, 2020). One of the fastest growing trends in the application of technology in education is (Means et al., 2013). An online class is a framework where, with the aid of internet-oriented technology, students can learn subjects, discuss problems with teachers, explain doubts with teachers, exchange content, and verify academic progress. Online classes are becoming so common today that they are likely to be expected in every formal curriculum for education. In addition, the worldwide rise in the COVID pandemic has also contributed to the value of online teaching. An interesting new way of teaching about everything is online teaching. The standard of education has been increased by the growing use of technology in the field of learning. Teachers have positive thoughts about lessons online. However, as far as online teaching goes, there is still a lot of space for growth.

6.2 Restatement of the Problem:

“A comparative study of Offline teaching mode and Online teaching mode as perceived by school teachers.”

6.3.1 Objectives of the study

1. To compare the offline teaching mode and online teaching mode as perceived by the secondary school teacher.
2. To compare the offline teaching mode and online teaching mode among the secondary school teacher with reference to gender.
3. To compare the offline teaching mode and online teaching mode among the secondary school teacher with reference to affiliated boards.
4. To compare the online mode of teaching and offline mode of teaching with reference to teaching subjects.
5. To compare the online mode of teaching and offline mode of teaching with reference to experience.
6. To compare online mode and offline mode among the secondary school teacher with reference to classroom preparation.
7. To compare online teaching mode and offline teaching mode of classroom preparation on the basis of gender.
8. To compare online teaching mode and offline teaching mode of classroom preparation on the basis of boards.
9. To compare online teaching mode and offline teaching mode of classroom preparation on the basis of subjects.
10. To compare online teaching mode and on offline teaching mode of classroom preparation on the basis of experience.
11. To compare online mode and offline mode among the secondary school teacher with reference to content delivery.
12. To compare online teaching mode and offline teaching mode of content delivery on the basis of gender.

13. To compare online teaching mode and offline teaching mode of content delivery on the basis of affiliated boards.
14. To compare online teaching mode and offline teaching mode of content delivery on the basis of teaching subjects.
15. To compare online teaching mode and offline teaching mode of content delivery on the basis of experience
16. To compare online mode and offline among the secondary school teacher with reference to classroom interaction.
17. To compare online teaching mode and offline teaching mode of classroom interaction on the basis of gender.
18. To compare online teaching mode and offline teaching mode of classroom interaction on the basis of affiliated boards.
19. To compare online teaching mode and offline teaching mode of classroom interaction on the basis of teaching subjects.
20. To compare online teaching mode and on offline teaching mode of classroom interaction on the basis of experience.
21. To compare online mode and offline mode among the secondary school teacher with reference to student's assessment
22. To compare online teaching mode and offline teaching mode of Student Assessment on the basis of gender.
23. To compare online teaching mode and offline teaching mode of Student Assessment the basis of affiliated boards.
24. To compare online teaching mode and offline teaching mode of Student Assessment on the basis of teaching subjects.
25. To compare online teaching mode and on offline teaching mode of Student Assessment on the basis of teaching experience.

6.3.2 Hypotheses of the study:

1. There is no significant difference between the Offline teaching mode and Online teaching mode as perceived by the secondary school teacher.
2. There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to gender.
3. There is no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated boards.
4. There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to teaching subjects.
5. There is no significant difference between the Offline mode of teaching and Online mode of teaching with reference to experience.
6. There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to classroom preparation.
7. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of gender.
8. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of boards.
9. There is no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of subjects.
10. There is no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of experience.
11. There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to content delivery.
12. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of gender.

13. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of affiliated boards.
14. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of teaching subjects.
15. There is no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of experience
16. There is no significant difference between Offline mode and Online among the secondary school teacher with reference to classroom interaction.
17. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of gender.
18. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of affiliated boards.
19. There is no significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of teaching subjects.
20. There is no significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of experience.
21. There is no significant difference between Offline mode and Online mode among the secondary school teacher with reference to student's assessment
22. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of gender.
23. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated boards.
24. There is no significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of teaching subjects.
25. There is no significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of experience.

6.3 Major finding of the study

1. There was a significant difference between the Offline teaching mode and Online teaching mode as perceived by the secondary school teachers.
2. There was a significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to male and female teachers.
3. There was a significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated CBSE boards.
4. There was no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to ICSE affiliated boards.
5. There was a significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated SSC boards.
6. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to Language teaching subjects.
7. There was a significant difference between the Offline mode of teaching and Online mode of teaching with reference to Mathematics teaching subjects.
8. There was a significant difference between the Offline mode of teaching and Online mode of teaching with reference to Science teaching subjects.
9. There was a significant difference between the Offline mode of teaching and Online mode of teaching with reference to Social Science teaching subjects.
10. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 3 to 5 years teaching experience.
11. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 6 to 10 years teaching experience.

12. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 11 to 15 years teaching experience.
13. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 20 years and above teaching experience.
14. There was a significant difference between Offline mode and Online mode among the secondary school teacher with reference to classroom preparation.
15. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of male teachers.
16. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of female teachers.
17. There was a significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of CBSE boards.
18. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of ICSE boards.
19. There was a significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of SSC boards.
20. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Language subjects.
21. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Mathematics subjects.
22. There was a significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Science subjects.
23. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Social science subjects.
24. There was a significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 3 to 5 teaching experience.

25. There was a significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 6 to 10 teaching experience.
26. There was no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 11 to 5 teaching experience.
27. There was no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 20 years and above teaching experience.
28. There was a significant difference between Offline mode and Online mode among the secondary school teacher with reference to content delivery.
29. There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of male teacher.
30. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of female teacher.
31. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of CBSE affiliated boards.
32. There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of ICCSE affiliated boards.
33. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of SSC affiliated boards.
34. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Language teaching subjects.
35. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Mathematics teaching subjects.
36. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Science teaching subjects.

37. There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Social science teaching subjects.
38. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of 3 to 5 years' experience
39. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of 6 to 10 years' experience
40. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of 11 to 15 years' experience
41. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of 20 years and above experience
42. There was a significant difference between Offline mode and Online among the secondary school teacher with reference to classroom interaction.
43. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of male teachers.
44. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of female teachers.
45. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of affiliated CBSE boards.
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48. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of Language teaching subjects.
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51. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of Social science teaching subjects.
52. There was a significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of 3 to 5 experience.
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54. There was a significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of 11 to 15 experience.
55. There was a significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of 20 and above experience.
56. There was a significant difference between Offline mode and Online mode among the secondary school teacher with reference to student's assessment
57. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of male teacher.
58. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of female teacher.
59. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated CBSE boards.
60. There was a no significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated ICSE boards.
61. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated SSC boards.
62. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of Language teaching subjects.

63. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of Mathematics teaching subjects.
64. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of Science teaching subjects.
65. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of Social science teaching subjects.
66. There was a significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of 3 to 5 years teaching experience.
67. There was a significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of 6 to 10 years teaching experience.
68. There was a significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of 11 to 15 years teaching experience.
69. There was a significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of 20 years and above teaching experience.

6.4 Conclusion of the study:

1. There was a significant difference between Offline teaching mode and Online teaching mode as perceived by the secondary school teacher. Mean value of Online teaching mode was more than offline teaching mode it shows that secondary teachers was more comfortable in online teaching mode. This could be attributed to the fact that teachers have grown comfortable with online methods as they were using this mode of teaching for around 2 yrs. due to the pandemic.

2. There was significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to male and female teachers. Mean value of Online teaching mode of male and female teachers was more than Offline teaching mode it shows that Online teaching mode methods was preferred by all irrespective of the gender.
3. There was significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated CBSE boards. Mean value of CBSE Online teaching mode was more than the Offline teaching mode which shows that CBSE boards teachers prefer online teaching mode as they were technically comfortable with this mode. There was no significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to ICSE affiliated boards. Mean value of ICSE was almost same in offline teaching mode and offline teaching mode it shows that the teachers were in favor of both the mode. There was significant difference between the Offline teaching mode and Online teaching mode among the secondary school teacher with reference to affiliated SSC boards. Mean value of SSC Online teaching mode was more than the Offline teaching mode which shows that SSC boards teachers prefer online teaching mode as they were technically comfortable with this mode.
4. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to Language teaching subjects. Mean value of Online teaching and Offline teaching was almost same with reference to language teaching subjects which shows that theoretical subjects can be easily taught with both the mode. There was a significant difference between the Offline mode of teaching and Online mode of teaching with reference to Mathematics teaching subjects. Mean value of online teaching mode was more than in offline teaching mode which shows the perception of teachers that they were more quick and could easily solve their queries in online teaching mode. There was a significant difference between the Offline mode of teaching and Online mode of

teaching with reference to Science teaching subjects. Mean value was more than the offline teaching mode which shows that the teachers could be easily clear the doubts of the students through the digital education. There was significant difference between the Offline mode of teaching and Online mode of teaching with reference to Social Science teaching subjects. Mean value of online teaching mode was more than the offline teaching mode which shows that teachers could teach social science subject in more effective way through online teaching mode.

5. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 3 to 5 years teaching experience.

There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 6 to 10 years teaching experience. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 11 to 15 years teaching experience. There was no significant difference between the Offline mode of teaching and Online mode of teaching with reference to 20 years and above teaching experience. Mean value of online teaching mode was almost same as the offline teaching mode with reference to all the teachers having different teaching experience. It clearly shows the perception of all the teachers having different teaching experience were comfortable with both the mode of teaching.

6. There was a significant difference between Offline mode and Online mode among the secondary school teacher with reference to classroom preparation. Mean value of offline teaching mode was more than the online teaching mode which shows that classroom preparation for offline teaching was easy than the online teaching mode.
7. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of male and female teachers. Mean value of offline teaching mode of classroom preparation was almost same to online teaching mode. It shows that teachers were giving the same time for both modes of teaching in preparation it was convenient for them.

8. There was a significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of CBSE boards. Mean value of offline teaching of classroom preparation on the basis of CBSE boards mode was more than the online teaching mode which shows that CBSE board teachers were more comfortable in offline teaching mode for the classroom preparation. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of ICSE boards. Mean value of online and offline classroom preparation on the basis of ICSE boards are almost same, which shows that ICSE boards teachers were comfortable and convenient with both the mode for classroom preparation. There was significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the basis of SSC boards. Mean value of online teaching of classroom preparation on the basis of CBSE boards mode was more than the offline teaching mode. which shows that SSC board teachers were more comfortable in online teaching mode for the classroom preparation
9. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Language teaching subjects. Mean value of Online teaching and Offline teaching was almost same with reference to classroom preparation on the Language teaching subjects which shows that Language subjects could easily prepare with both the mode. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Mathematics subjects. Mean value of Online teaching and Offline teaching was almost same with reference to classroom preparation on the Mathematics teaching subjects which shows that this subject could easily prepare with both the mode of teaching. There was significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Science subjects. Mean value of Offline teaching mode was more than online teaching mode with reference to classroom preparation on the Science teaching subjects which shows that teachers were

comfortable to prepare the science subject more easily with the offline mode. There was no significant difference between Offline teaching mode and Online teaching mode of classroom preparation on the Social science subjects. Mean value of Online teaching mode and Offline teaching was almost same with reference to classroom preparation on the social science teaching, which shows perception of social science teacher that Social Science subject could easily prepare with both the mode of teaching.

10. There was significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 3 to 5 years and 6 to 10 years teaching experience. Mean value of Offline teaching mode was more than Online teaching mode. It shows that teachers having less experience were comfortable in offline teaching mode classroom preparations. There was no significant difference between Offline teaching mode and on Online teaching mode of classroom preparation on the basis of 11 to 15 and 20 years and above teaching experience. Mean value was almost same in offline teaching mode and online teaching mode. It shows perception of teachers having more experience were comfortable with the teaching modes based on classroom preparation.
11. There was a significant difference between Offline mode and Online mode among the secondary school teacher with reference to content delivery. Mean value of Offline teaching mode was more than the Online teaching mode. It shows that teachers were more comfortable in offline teaching mode with reference to content delivery.
12. There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of male teacher. Mean value of Offline teaching mode and Online teaching mode was almost same which clearly shows that male teachers are comfortable with both the mode for content delivery. There was significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of female teacher. Mean value of Offline teaching mode is more than the Online teaching mode which shows that

the female teachers are comfortable with offline teaching mode for content delivery.

13. There was significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of CBSE affiliated boards.

Mean value of Offline teaching mode was more than Online teaching mode which shows that the CBSE board teachers were more comfortable for content delivery in Offline teaching mode as compare to online teaching mode.

There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of ICSE affiliated boards. Mean value of offline teaching mode and Online teaching mode were almost same which shows that the ICSE board teachers were comfortable in both the mode with reference to content delivery. There was significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of SSC affiliated boards. Mean value of Offline teaching mode was more than the online teaching mode which shows that SSC board teachers were more comfortable for content delivery with offline teaching as compare to online teaching mode.

14. There was significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Language, Mathematics and Science teaching subjects. Mean value of Offline teaching mode was more than the Online teaching mode of content delivery based on these teaching subjects which clearly shows that teachers could effectively teach these subjects through offline teaching mode. There was no significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of Social science teaching subjects. Mean value of offline teaching mode and online teaching mode was almost same so it shows that Social science subjects teacher could comfortably teach with both the mode.

15. There was a significant difference between Offline teaching mode and Online teaching mode of content delivery on the basis of 3 to 5 years, 6 to 10 years, 11 to

15 years' and 20 years and above teaching experiences. It shows that all the teachers were prefer Offline teaching mode with reference to content delivery.

16. There was a significant difference between Offline mode and Online among the secondary school teacher with reference to classroom interaction. Mean value of Online teaching mode was more than for classroom interaction which shows that secondary school teachers prefer online mode to quick and fast interaction with the students.
17. There was a significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of male teachers and female teachers. Mean value of Online teaching mode was more than the offline teaching mode it clearly shows that the teachers were preferred online teaching mode of classroom interaction irrespective of gender.
18. There was significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of affiliated CBSE boards, ICSE board and SSC board. Mean value of Online teaching mode was more than the offline teaching mode which clearly shows that teachers were preferred offline teaching of classroom interaction irrespective of affiliated boards.
19. There was significant difference between Offline teaching mode and Online teaching mode of classroom interaction on the basis of Language, Mathematics Science and Social science teaching subjects. Mean value of Online teaching mode was more than the Offline teaching mode which shows that teachers were preferred quick, fast and easy interaction with the online mode.
20. There was significant difference between Offline teaching mode and on Online teaching mode of classroom interaction on the basis of 3 to 5, 6 to 10, 11 to 15 years and 20 years and above teaching experience. Mean value of Online teaching mode was more than Offline which clearly shows that the teachers were preferred Online teaching for classroom interaction in online teaching mode.
21. There was significant difference between Offline mode and Online mode among the secondary school teacher with reference to student's assessment. Mean value

of Offline teaching mode was more than the Online teaching mode. Which clearly shows that the teachers were preferred Offline teaching mode of student assessments.

22. There was significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of male teacher and female teacher. Mean value of offline teaching mode was more than the online teaching mode which shows that the teachers preferred offline teaching mode with reference to Student assessment.
23. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated CBSE and SSC boards. Mean value of Offline teaching mode was more than Online mode of teaching which shows that CBSE and SSC teachers preferred Offline teaching mode of Student assessments. There was no significant difference between Offline teaching mode and Online teaching mode of Student Assessment the basis of affiliated ICSE boards. Mean value of Offline teaching mode and Online teaching mode was almost same. It clearly shows that ICSE board teachers were comfortable with both the mode of student assessments.
24. There was a significant difference between Offline teaching mode and Online teaching mode of Student Assessment on the basis of Language, Mathematics, Science, Social science, teaching subjects. Mean value of Offline teaching mode was more than online teaching mode which clearly shows that teachers were preferred Offline teaching mode of student's assessment based on teaching subjects
25. There was a significant difference between Offline teaching mode and on Online teaching mode of Student Assessment on the basis of 3 to 5 years, 6 to 10 years, 11 to 15 years, 20 years and above teaching experience. Mean value of Offline teaching mode was more than the online teaching mode which shows clearly that all the teachers preferred Offline teaching mode of Student assessments.

6.5 Recommendations:

- It is recommended that similar study be conducted on all the students and professors.
- It is recommended that similar study to be conducted to find out perception of the students about Online teaching mode and Offline teaching mode
- It is recommended that similar study be conducted on Online teaching techniques and its effectiveness on Secondary school students.
- It is recommended that similar study be conducted on state, national and international level teachers of various department.
- Cognitive and teaching experience makes online teaching effective.
- The result of the study will help the teachers about their teaching methods in Online as well as Offline teaching mode.
- The present study's findings indicate that instructor quality is a significant determinant of teacher's satisfaction during online classes amid a pandemic.
- The present study results contribute to the profession of education by illustrating a realistic approach that can be used to recognize teachers' expectations in their class effectively.
- The same study can be replicated for the other levels of education.
- The same study can be conducted for the teachers to find out the effectiveness of both the mode urban and rural areas.
- The teaching-learning process may be made more attractive with ICT in education.
- For better e-learning, more computer facilities and internet access need to be provided.
- To maximize public education, an e-learning system should be launched by the government.

6.6 Suggestions for further research:

After research is completed, researcher feels certain gaps and lapse during the process of investigation which are not removed or improved due to reasons. During research, investigator realizes several views related to their research and other aspects. In the light of the experiences gained during this research study, following suggestions are recommended for future research.

- ✓ Similar studies can be conducted on teachers of different departments.
- ✓ A correlation study between teacher's satisfaction and teaching presence in Online teaching mode and Offline teaching mode can be conducted.
- ✓ Studies related to impact and effectiveness of online teaching mode and offline teaching mode on student's classroom interaction, student's achievements can be conducted.
- ✓ The study can be conducted on student's perception and their satisfaction with Offline teaching mode and Online teaching mode.
- ✓ The curriculum of secondary school can be analyzed in the background of teaching experience provided later for improvement of teaching methods and techniques for both the mode.

6.7 Conclusion:

Secondary education in India is currently restricted by lack of clarity when it comes to regulating online teaching mode of education. (nambiar, 2020) Teachers and students' comfort with online class design, structure, level of interaction between students and faculty, the quality and amount of class content, technical support, and overall experience with online class delivery impact the overall teaching and learning experience and determines the ultimate success or failure of online mode of teaching.

Thus, awareness needs to be increased focusing on the convenience and accessibility aspect in order to increase the adoption of online mode of teaching

by teachers. Frustration with class structure and design may translate into a poor learning outcome for students. Teachers need to observe the change in their roles, i.e. from merely being a conduit of information to the planner of the instructional method. Students are often said to be spoon-fed in conventional classroom schooling, but online teaching needs a learner-centered atmosphere that allows students to be self-motivated and self-motivated. Teachers ought to invest every effort into improving student mindsets. Schools or government must periodically carry-on training and learning projects for teachers as well as students to accomplish this aim. The study also revealed that online teaching mode has a more important role to play in the future, but it will not replace Offline mode of teaching education in the classroom. It is very tricky to make a full transition to online mode of teaching. The advantages resulting from online teaching mode, however, should not be overlooked. As such, it is important to consider and take corrective steps to resolve the barriers that fall in the way of embracing online teaching mode.

(jaysuiya) If we go wider to give a wide definition to the process of teaching, we cannot certainly replace a mother with online teaching (at least till now) which can help babies to learn from the day they were born till they get the understanding of life they would later lead independently. So, for the time being we found out that it is very hard to replace offline mode, chalk and talk system with online teaching mode. But online blended approach of online mode add offline mode of teaching method can enhance learner's knowledge and interest in a broader perspective. Our future research will be focused on the availability, access, and real use of online mode of teaching systems in schools worldwide.

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APPENDIX A

List of Experts:

Serial No.	Name of Expert
1	Dr. Saramma Mathew M.A. M.Ed. M. Phil., Ph.D. (Education) Professor in Pillai College research and Education Panvel.
2	Dr. Alka Shetty Ph.D. and M.A in Economics, B.Ed. NET, SET Senior secondary teacher in APEEJAY school Nerul (Navi Mumbai)
3	Ms. Akhila Dinesh M.Sc. M.Ed. Principal of NPS school Mysore Karnataka
4	Ms. Sonika Srivastava M.Sc. in Physics, B.Ed. Senior secondary teacher in APEEJAY school Nerul (Navi Mumbai)
5	Dr. Alka Kinara Educational consultant Managing director of Cerebrum pvt. ltd.

APPENDIX B

Permission letter



Dr. Pillai Teachers Training & Research Centre
Plot 1, Sector 8, Khanda Colony,
New Panvel - 410206 Tel: 2748 0289, 2748 1864
Fax: 2746 4161
NAAC Accredited 'A' Grade

MAHATMA EDUCATION SOCIETY'S

PILLAI

COLLEGE OF

EDUCATION & RESEARCH

PCERP/M.Ed./418/2021

Date: _____

To
The Principal

*Convent of Jesus & Mary's school
Kherghave*

Sub: Request for Data Collection

Sir/Madam,

Deepthi Acharya is currently doing his/her M.Ed. from our college. As part fulfillment of the syllabus she/he has to conduct an educational research. The topic of the research is *A Comparative study of offline teaching mode and online teaching as perceived by secondary school teachers*. I humbly request you to permit our student to collect the data from your esteemed institution (i.e. from teachers/students) via online/offline mode.

Kindly give permission for the data collection.

Thank you,

Yours truly,


Dr. (Ms.) Sally Enos
PRINCIPAL
MAHATMA EDUCATION SOCIETY'S
Pillai College of Education & Research
Dr. Pillai Teacher Training & Research Centre
Plot No. 1, Sector-8, Khanda Colony,
New Panvel-410 206.



APPENDIX C

LIST OF SCHOOLS:

- 1. MNR The school of excellence,**
Sector 6 Kamothe, Navi Mumbai
- 2. Convent of Jesus and Marry High school**
Sector 6, Kharghar, Navi Mumbai
- 3. Dyan Pushp Vidya Niketan**
Sector 5, Belapur, Navi Mumbai
- 4. Apeejay school**
Sector 21, Kharghar, Navi Mumbai
- 5. Apeejay School**
Sector 7, Nerul, Navi Mumbai
- 6. Mahatma school**
Khanda colony, Panvel, Navi Mumbai
- 7. New Horizon Public school**
Khanda colony, Panvel, Navi Mumbai
- 8. Ram Sheth Thakur school**
Sector 18 Kharghar, Navi Mumbai
- 9. Empyrion School**
Sector 35 Kharghar, Navi Mumbai
- 10. KPC school**
Sector 18 Kharghar, Navi Mumbai

APPENDIX D

TOOL A: ONLINE TEACHING MODE AS PERCIVED BY SCHOOL TEACHERS (SECONDARY)

GENERAL INFORMATION:

GENDER: M/F

BOARD: SSC/CBSE/ICSE/IGCSE

SUBJECT: LANG/SST/SCI/MATHS

TEACHING EXPERIENCE :3-5 YEARS, 6-10YEARS, 11-15YEARS, 20 YEARS AND ABOVE

This questionnaire will ask you to respond to a number of statements. You are requested to read each statement carefully and tick the scale - to what extent the statement applies to you.

SD: Strongly disagree, DA: Disagree NEU: Neutral A: Agree SA: Strongly Agree:

No.	STATEMENT	SD	DA	NEU	A	SA
1	Online classroom environment makes it easier for me to communicate with my student.					
2	Preparation time for online teaching mode is stressful.					
3	I feel online mode of teaching is less effective than offline mode of teaching.					
4	I could easily adopt to the online mode of teaching.					
5	I can pay equal attention to every student in the class in an online mode of teaching.					
6	Clarification of the doubts is easier in the online mode of teaching.					
7	I am technically prepared for the online mode of teaching					
8	Online teaching is more time consuming than offline mode of teaching.					
9	It is difficult to engage students in online teaching mode.					
10	Online classroom is more fun and creative than offline classroom.					
11	It is difficult to keep classes for longer duration in an online teaching mode.					
12	I am able to deliver the content effectively through online mode of teaching.					
13	I could take classes without much interruption through online mode of teaching.					
14	During the online teaching it is easy to conduct group activity and individual activity.					
15	I could incorporate group activities in online mode of teaching.					

16	It is easy to share and facilitate the information through the online mode of teaching.					
17	I could use activity mode through online mode of teaching.					
18	Technical issue affects the flow and pace of delivering the content in an online mode of teaching.					
19	I could easily complete the given syllabus through online mode.					
20	I am able to communicate with the students without any internet issue through online teaching mode.					
21	Students are able to give their response without hesitations through online teaching mode.					
22	It is difficult to grasp the state of student's expression and actions through online teaching mode.					
23	Online teaching mode provides more opportunity for interaction than offline teaching mode.					
24	Classroom interaction is more effective in online mode of teaching.					
25	It is difficult to control group discussion in an online teaching mode					
26	Online teaching mode is possible for only theoretical subjects.					
27	Evaluation of student assessment in online mode is easy as compared to offline mode of teaching.					
28	It is easy to keeping track of students performance in an online mode of teaching.					
29	I am unable to check the homework and progress of the students effectively in online teaching mode.					
30	It is difficult to assess the performance of every student in an online mode of teaching.					
31	It is possible to assess all aspects of the student's performance through Online mode of assessment					
32	It's easy to check the test paper in online mode as compared to offline mode.					

**TOOL B: OFFLINE TEACHING MODE AS PERCIVED BY SCHOOL
TEACHERS (SECONDARY)**

This questionnaire will ask you to respond to a number of statements. You are requested to read each statement carefully, and tick the scale - to what extent the statement applies to you.

SD: Strongly disagree, DA: Disagree NEU: Neutral A: Agree SA: Strongly Agree:

No.	STATEMENT	SD	DA	NEU	A	SA
1	Offline classroom environment makes it easier for me to communicate with my student.					
2	Preparation time of content for offline teaching mode is less stressful.					
3	I feel offline mode of teaching is only information based teaching with necessary contents.					
4	It's easy to prepare content for offline mode of teaching.					
5	I can pay equal attention to every student in the class in an offline mode of teaching.					
6	I could clear the doubts and questions quickly raised by the students in the offline teaching mode.					
7	offline mode of teaching is more comfortable than online mode of teaching.					
8	Offline teaching is more time consuming than online mode of teaching.					
9	In Offline teaching mode use of innovative teaching methods are possible.					
10	Offline teaching mode reduce the sense of isolation for the students.					
11	It's easy to deliver the content effectively through offline mode of teaching.					
12	Offline teaching mode provide stimulating environment that combines both theoretical and practical aspect of learning.					
13	In offline teaching mode it is easy to conduct group activity and individual activity.					
14	I am able to use discussion as teaching strategy for the subject that I teach.					
15	In offline teaching mode classroom demand some extra creativity, energy to teach an engaging student for fruitful lesson.					
16	The presence of a teacher physically in a classroom keeps the students attentive.					
17	Students are able to give their response without hesitations through offline teaching mode.					

18	I am able use gesture and posture effectively in an offline teaching mode.					
19	Offline teaching mode provide more opportunity for interaction than online teaching mode.					
20	Classroom interaction is more effective through face-to-face interaction in offline teaching mode.					
21	Offline teaching mode has unique interaction and emotional exchange between students and teachers.					
22	It's easy to evaluate the student assessment through offline mode.					
23	It is easy to keeping track of students performance in an offline mode.					
24	I am able to check the homework and progress of the students effectively through offline mode.					
25	I can easily assess the performance of every student in classroom in an offline mode.					
26	It's easy to check the test paper physically in offline mode as compared to online mode.					
27	It is possible to assess all aspects of the student's performance through Offline mode of assessment					