The Online Journal of Distance Education and e-Learning

Message from the Editor-in-Chief

Dear Colleagues,

TOJDEL welcomes you. TOJDEL would like to thank you for your online journal interest. We are delighted that many international educators, teachers, parents, and students from around the world have visited for ten years. It means that TOJDEL has continued to diffuse new trends in distance education to all over the world since January 2013. We hope that the volume 10, issue 4 will also successfully accomplish our global distance education goal.

TOJDEL is confident that readers will learn and get different aspects on distance education. Any views expressed in this publication are the views of the authors and are not the views of the Editor and TOJDEL.

In this issue, in cooperation with Indian academics, TOJDEL started to publish scientific articles from other field of science. I am sure that this innovation will contribute to the global development of our magazine.

TOJDEL thanks and appreciate the editorial board who have acted as reviewers for one or more submissions of this issue for their valuable contributions.

TOJDEL will organize IDEC-2023 International Distance Education Conference (www.id-ec..net) between July 28-29, 2023 in Roma, Italy. This conference is now a well-known distance education event. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about distance education.

Call for Papers
TOJDEL invites you article contributions. Submitted articles should be about all aspects of distance education. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJDEL. Manuscripts must be submitted in English.

TOJDEL is guided by it's editors, guest editors and advisory boards. If you are interested in contributing to TOJDEL as an author, guest editor or reviewer, please send your cv to tojdel.editor@gmail.com.

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CONVERGENCE OF FACE-TO-FACE AND DISTANCE EDUCATION- A STUDY ON THE IMPACT OF THE COVID-19 PANDEMIC

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ABSTRACT:
The COVID-19 pandemic created a large number of challenges for every walk of life. Economies were devastated by its impact and established norms were disrupted. Education became an instant casualty of the pandemic. Schools and colleges were closed and all campus-based activities came to a standstill. All institutions were forced to look at alternative pedagogies to leap over the challenges. Consequently, a convergence of traditional and distance education-based pedagogies was seen. The present paper presents the attitude of the educationists working in India towards the convergence of pedagogy, which has been witnessed in recent times. It also looks into how the convergence of pedagogy can be made more effective.
Keywords: convergence of pedagogy, distance education, face-to-face education, COVID-19

1. Introduction

The COVID-19 pandemic is an epoch-making event in the history of the world. The enormity and suddenness of the outbreak left every segment of the world in a state of shock and disbelief. Never since the containment of the Spanish flu had a virus wrecked so much havoc on the world. The advanced nations came to understand that their much-admired health infrastructure was no match for the virus. Developing countries were forced to undertake a rear-guard fight to contain the pandemic in light of the crumbling infrastructure. The education sector also witnessed far-reaching changes. The brick-and-mortar infrastructure built up by institutions across the globe became redundant for a certain period. Classrooms became empty. Hostels were evacuated. Cost-cutting measures were initiated and many in the academic circles lost their jobs.

Yet, one of the developments of great importance that emerged during this period was that many of the pedagogic techniques and technologies which were strictly associated with Distance and online learning found their way into the conventional modes of education. Live streaming, online classes, online discussion forums and the like, which were for long associated with the distance modes of pedagogy, found their way into mainstream education. Whether these changes were cosmetic or if they are going to be a regular feature in the future is a matter of substantial interest to the educational fraternity.

The practitioners in the field of education hold significant influence in the decision-making process in the sector. What is their perception of the aspect of convergence of distance and face-to-face pedagogy? This is an issue that we shall explore in the present study.

2. Objectives of the study

The objectives of the current study are:

1.1. To analyse the understanding of educational experts and officials regarding the essentials of face-to-face and distance education.
1.2. To understand how far the respondents believe that there has been a convergence between the face to face and distance education as a result of COVID.
1.3. To gauge the perception of the respondents as to the areas in which further convergence could happen

3. Methodology of the study

A questionnaire was administered online on the topic "Has COVID-19 created a convergence between Face to face and Distance Education?" to functionaries of various higher educational systems. In response, 36 persons responded to the questionnaire. The questionnaire elicited the views of the respondents on various themes under the broad topics- 'Defining Features of a conventional education system', 'Convergence of face-to-face and distance education in the COVID -19 pandemic period' and 'suggestions for enhancing the efficacy of pedagogy through convergence'.

4. Review of Literature

The review of existing literature on the topic reveals interesting discussions on Face to Face and Distance education in the context of recent realities.

Farah Otaki et al. (2021) state that those educational organizations that adopted ICT and web-based technologies before the onset of the COVID-19 pandemic fared much better at adapting to the COVID-driven situation than those which migrated to the same after the onset of the pandemic.

Jitendra Singh et al. (2021) state that a meaningful academic experience can be provided to learners only if the management of educational institutions provides appropriate infrastructure for hybrid and blended learning. Capacity building of faculty members, especially in online tools is essential for supporting hybrid and blended learning processes.

Muhammad Naeem Khan et al. (2021) use the theory of Constructivism and the structural equation model to analyse the impact of the use of Social Media on the learning outcomes of students. They conclude that Social Media plays an important role in the learning processes of students during the pandemic by enhancing their ability for Constructive Learning.

Schleicher (2020) states that to overcome the effects of the pandemic on the education system, many countries have tried to encourage distance and online tools. For instance, Italy initiated a programme to equip schools with digital tools, lent digital learning devices to less privileged learners and trained school staff in the pedagogy of distance learning and teaching.

Ugorji I. Ogbonnaya et al. (2020) considers online education tools to be a boon during the pandemic period. The study finds that most of the pre-service teachers accessed digitally using smartphones. Online learning tools enabled pre-service teachers to collaborate effectively with tutors and interact with peers. However, the major hindrances in prosecuting the study process effectively were infrastructural constraints, poor internet connectivity, erratic power supply etc.

Davy Tsz Kit Ng et al. (2020) opine that teachers play a pivotal role in combining the advantages of both the synchronous and asynchronous modes of education. Such a combination affords extensive social interaction among the learners. The authors identify, the digital divide, data privacy issues, and the absence of professional leadership to be areas of key concern.

Sharma D et al. (2022) state that there are clear advantages and disadvantages of both online and offline modes of education. The authors put the opinion of 654 respondents to a chi-square test and found a clear association between the opinions of the questions.

Singh J et al. (2021) dwells deeply into the various facets of online learning; the emergence of a hybrid mode of learning and the various nuances associated with the training aspect of staff involved in handling this complex mechanism. The authors go on to present a SWOT analysis as well as a fishbone analysis in their study.

The review of the literature has revealed key gaps in the existing studies which shall be addressed in the study

5.   The Study in Detail

36 responses were received for the online questionnaire on the topic**,** 'Has COVID-19 created a convergence of pedagogy between Face to face and Distance Education?' The demographic details of the participants are provided below:

5.1. Age-wise distribution of the respondents

Figure 1 gives a clear view of the age-wise distribution of the respondents. While 8.3% of the respondents belong to the age group "21-30", 13% of the respondents belong to the age group "31-40". Further, 30.6% of the respondents were in the age group "41-50", while 13.9% of the respondents belonged to the age group, '51-60' and 33.3% belonged to the age group "above 60".

Age
36 responses
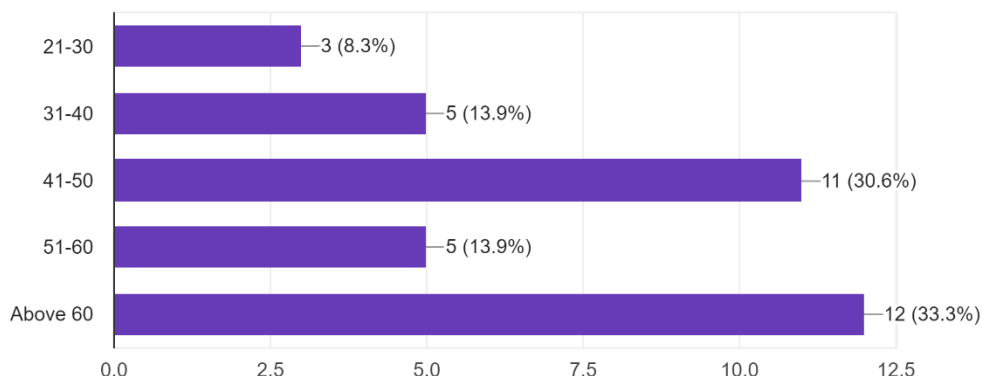
Figure 1: Age-wise distribution of the respondents

5.2. Gender-wise Distribution of respondents

It is seen from the available data on respondents that there was an equal distribution of male and female respondents to the questionnaire. Figure 2 makes this division clear.

Sex
36 responses
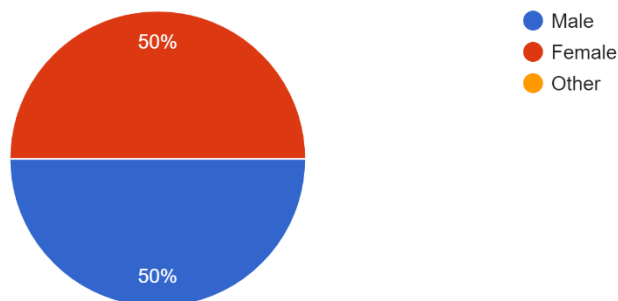
Figure 2- Gender-wise Distribution of respondents

5.3. Distribution of respondents according to the institution they work in

The respondents for the questionnaire work in a variety of institutions. 36.1% of the respondents work in universities, while 19.4% work in self-financing colleges and Government Aided Colleges respectively. This distribution is made clear by the following figure.

Institution in which you are working
36 responses
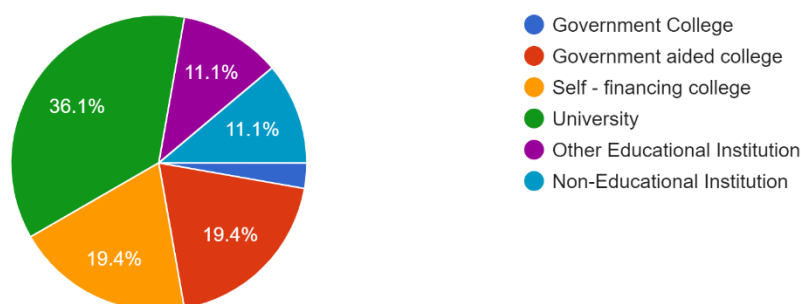
Figure 3- Distribution of respondents according to the institution they work in

5.4. Level at which the respondents are working

The respondents are engaged at different levels at various institutions as indicated in Figure 4 below.

Level at which working
36 responses
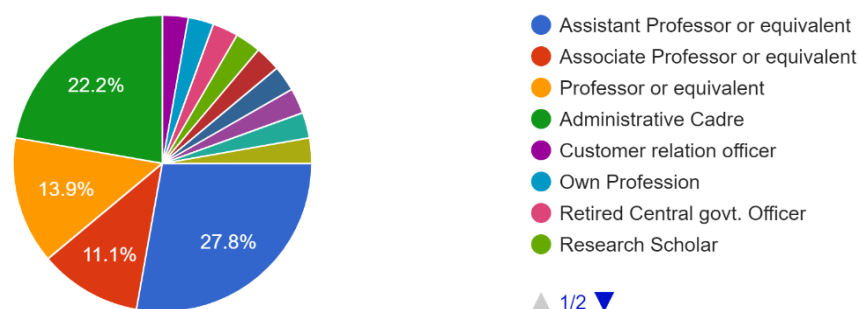
Figure 4- Level at which the respondents are working

It is seen clearly from Figure 4 that nearly 28% of the respondents work at the Assistant Professor and equivalent level, and 11% work at the level of Associate Professor or equivalent. 13.9% of the respondents work at the Professor or equivalent level. 22.2% of the respondents work in administrative cadres and the rest of the respondents came from diverse occupational levels other than those mentioned above such as customer relations, research, self-employment etc.

5.5. **Responses to substantive questions**

The questionnaire raised several substantive questions which were responded to by the respondents.

5.5.1. **Defining Features of a conventional education system**

The respondents felt that there were certain key defining features of a conventional education system, which they ranked as given in Figure 5 below:

Which of the following do you associate the conventional education system most with? (you can tick more than one option)

36 responses
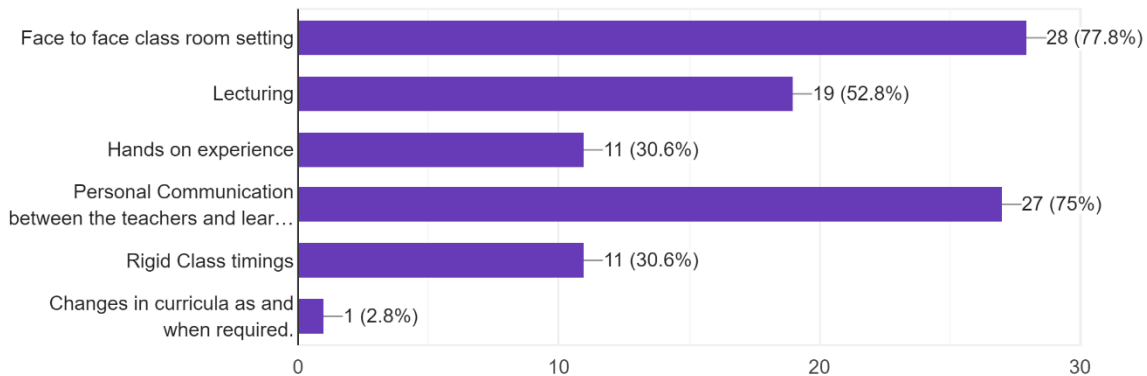
Figure 5: Defining Features of a conventional education system

Most of the respondents felt that transaction of curricula in a Face-to-Face classroom setting is an essential feature of the conventional education system (77.8%), while 75% felt that personal communication between the teachers and learners is an essential feature. 52.8% of the respondents felt that lecturing was a defining feature of the conventional education system. Interestingly, only 30.6% of the respondents felt that hands-on training and rigid class timings were essential features of the conventional education system. Only a minuscule proportion of respondents felt that effecting changes in the curricula as and when required was an essential feature of the conventional education system.

5.5.2. Defining Features of the Distance Education System

The respondents provided some very interesting responses for the identification of the defining features of the distance education system. The responses can be seen in figure 6 below. The majority of the respondents felt that an online classroom setting is an essential part of the distance education mechanism (61.1%), while a greater majority felt that a flexible study process was essential to distance education (66.7%). Only 38.9% and 25% of the respondents respectively felt that counselling and tutoring were essential aspects of distance education. Less than half of the respondents felt that Guided Didactic Conversation between the teacher and the learners was an essential aspect of distance education (44.4%).

Which of the following do you associate the distance education system most with? (you can tick more than one option)

36 responses
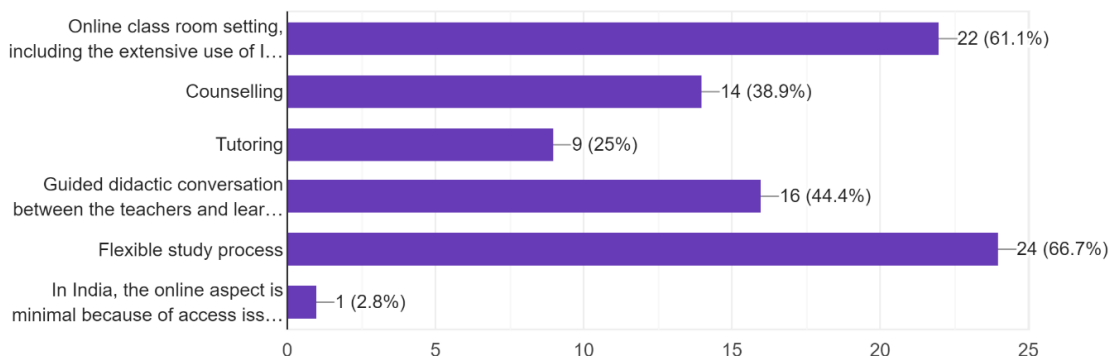
Figure 6: Defining features of a distance education system

5.5.3. **Main differences between Face to Face and Distance Education**

According to the respondents, there are major differences between the Face to Face and Distance modes of education. Their responses are given below:

a. Distance education is more helpful in information assimilation since there are more opportunities for face-to-face interaction in the former.

b. Self-motivation is required more in the distance mode of studies as compared to the face-to-face mode

c. The differences between the two have come down considerably due to the convergence of pedagogy during COVID times and both are using a blended approach

d. While Live interaction between the instructor and the learners is possible in Face-to-Face education, multi-dimensional content and learning exercises are possible in the Distance Education system.

e. In the face-to-face model, the teachers can identify the real gap in the student's understanding and suggest areas for improvement

f. Face-to-face education is real-time communication without any limitations but distance education has many limitations. Face-to-face education activates 5 senses to enable critical thinking, questioning and clarification of doubts while distance education activates the learner depending on the time, manner and place where the learner is attending

g. Face-to-face education gives importance to infrastructure in classrooms/colleges. Isolated teachers are prone to preach.

h. Distance Education has multiple modes of content delivery. It follows the course team approach in content development. Distance Education is technology dependant so not very much suitable for digital immigrants and populations in technology inaccessible regions. Quality enhancement in Distance Education can be accelerated and is easier than in the Face-to-face scheme.

i. Face-to-face education is more effective than distance education. The distance education mode is more useful for employed people for their further studies.

j. During this pandemic period distance education is more effective than face-to-face education.

k. Face-to-face education creates a very good bond between the teacher and the students. But the distance education system does not help establish the same

l. Face-to-face education helps students to socialize more and develop a personality which is difficult in distance education.

m. Distance learning is flexible, open type & highly technological. Whereas face-to-face learning is traditional & involves students and teachers interacting in real time

n. Face to face system is very systematic and distance education is very flexible

o. Flexibility, massiveness, self-study, more focus on qualifying for the exam, less chance for intimacy among teachers and learners in distance education unlike face-to-face education

p. Face to Face teaching is associated with rigid classroom teaching, minimum attendance is mandatory, whereas in ODL system Learners have the flexibility and can study at their own pace of time.

q. Face-to-face education is necessary until one gains minimum levels to pursue one's career whereas distance education offers a much broader aspect of education as it can help one learn and grow flexibly. It can also add up to your qualification in a less stressful manner.

r. Peer group interaction is limited in ODL mode while in regular mode it is more in face-to-face education

s. The face-to-face education system is good for small kids because at the basic level they need direct interaction with teachers to understand things clearly and easily. At higher level studies distance education is more useful because learners from any part of the country or world can learn.

5.5.4. **Convergence of face-to-face pedagogy and distance pedagogy in the COVID-19 pandemic period and after**

The question was posed to the respondents whether there has been a convergence of face-to-face and distance pedagogy during the pandemic period and after. The responses received have been shown in Figure 7 below. The figure details that while 69.4% of the respondents felt that there was a convergence of pedagogy during the pandemic period, 13.9% felt that there was no convergence, and 16.7% were not sure about the same.

Do you think that there has been a convergence of face to face pedagogy and distance pedagogy in the COVID-19 pandemic period and after?

36 responses

- Yes
- NO
- Not sure

13.9%
16.7%
69.4%
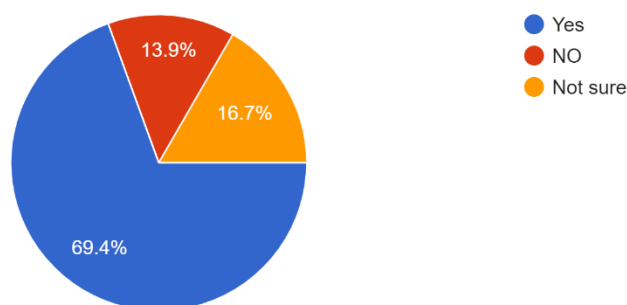
Figure 7: **Convergence of face-to-face pedagogy and distance pedagogy in the COVID-19 pandemic period and after**

Those who responded that such convergence had taken place, felt that the reason for the same was

a. During the COVID - 19 pandemic, there was no face-to-face counselling session and all conventional system of Education changed their mode of instruction to online.
b. The emergence of learning that combines online and face-to-face delivery is not novel--it is already being developed and implemented by schools throughout the country and the world, and in some cases has been underway for several years. While some schools call this method of teaching "blended," others call it "hybrid," and others don't bother naming it--they're just implementing an approach that they believe is helping their students. During the covid pandemic period, we implemented it in general.
c. The flexibility has brought in more areas of opportunities to get more experts into the faculty pool
d. Distance education makes teaching and learning easy.
e. Blended mode has several advantages
f. Learners are compelled to depend on distance education tools due to COVID.
g. There has been no difference between these groups as both were online during this period. Probably distance education students would have studied better than the others as they were having the support of readily pre-prepared notes.
h. Conventional Universities have also adopted 'Online' teaching during the Pandemic. ODL mode of teaching has been practising Online counselling for the last 3 decades.
i. Students at any level from primary to university level were getting online classes during covid-19 times.
j. It is not the pedagogic understanding or practice that has changed, only the mode, and superficially, largely.

5.5.5. **Aspects of convergence of pedagogy**

The respondents have indicated many areas in which the convergence of pedagogy has taken place. The ordering of the same is provided in Figure 8 below. From the depiction, it is clear that most respondents (83.3%) consider, the use of online classes as a major area of convergence between face-to-face and distance learning during the COVID period. Similarly, the use of online assignments along with the increase in asynchronous interaction has also been cited as strong indicators of convergence (61.1% each). The use of other digital tools was also seen as an indicator of convergence by 52.8% of the respondents. However, the acceptance of the "guided Didactic" principle was not seen in practice by most respondents in educational institutions and was hence not seen as a strong indicator of convergence in pedagogy (only 57.8%). The rest of the suggested indicators of convergence such as on-demand examination did not have many advocates.

If yes, which of the following are the major areas of convergence? (you may choose more than one)

36 responses
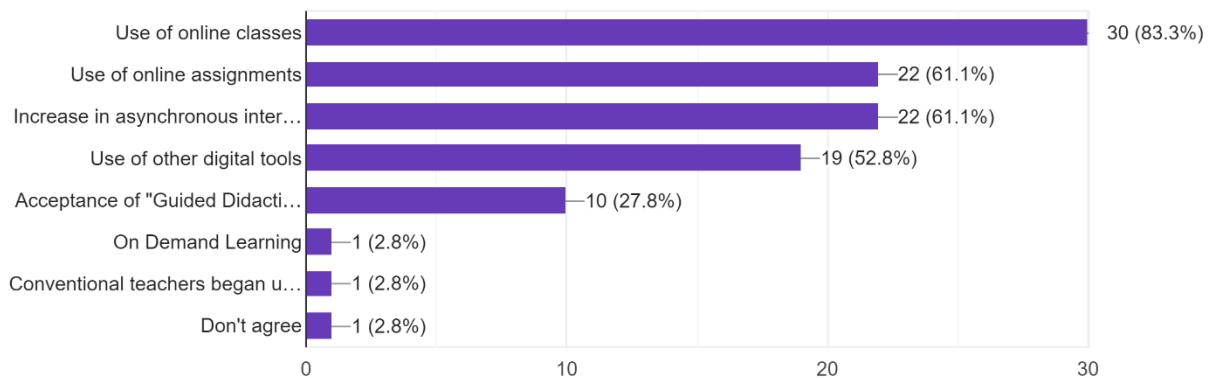
Figure 8 - **Aspects of convergence of pedagogy**

5.5.6. **Response of the teaching community to the convergence of pedagogy**

The response of the teaching community to the convergence of pedagogy provides important insights. The responses are indicated in Figure 9 below. From the responses, it is clear that the teaching community has on the whole welcomed the convergence of pedagogies, whereas a small proportion of respondents were indifferent regarding the same.

How has the teaching community reacted to convergence of pedagogy?
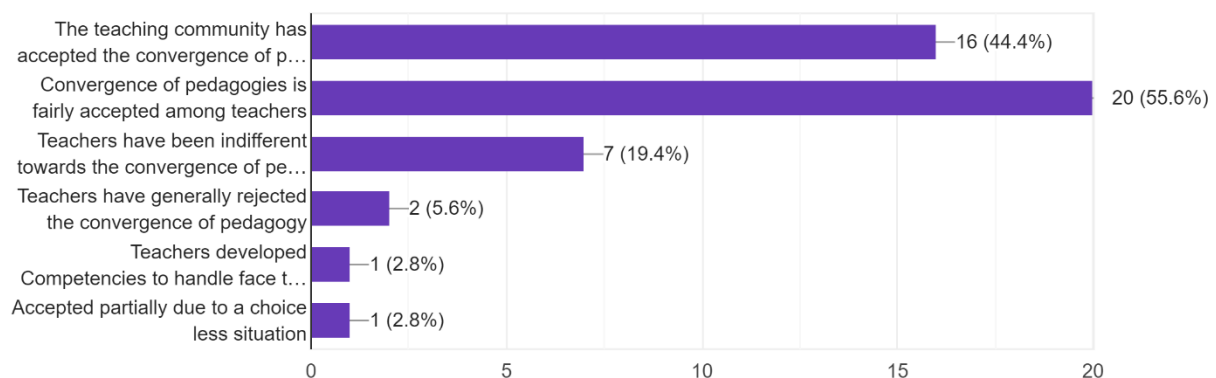
36 responses

Figure 9- Response of the teaching community to the convergence of pedagogy

5.5.7. **Response of the learners to the convergence of pedagogy**

The learners have positively accepted the reality of convergence of pedagogy between the face-to-face and distance modes of education (41.7%+44.4%) as is seen from the responses indicated in Figure 10 below. Lesser numbers of respondents feel that the learners are either indifferent or have rejected the convergence of pedagogy.

How has the student community reacted to convergence of pedagogy?
36 responses
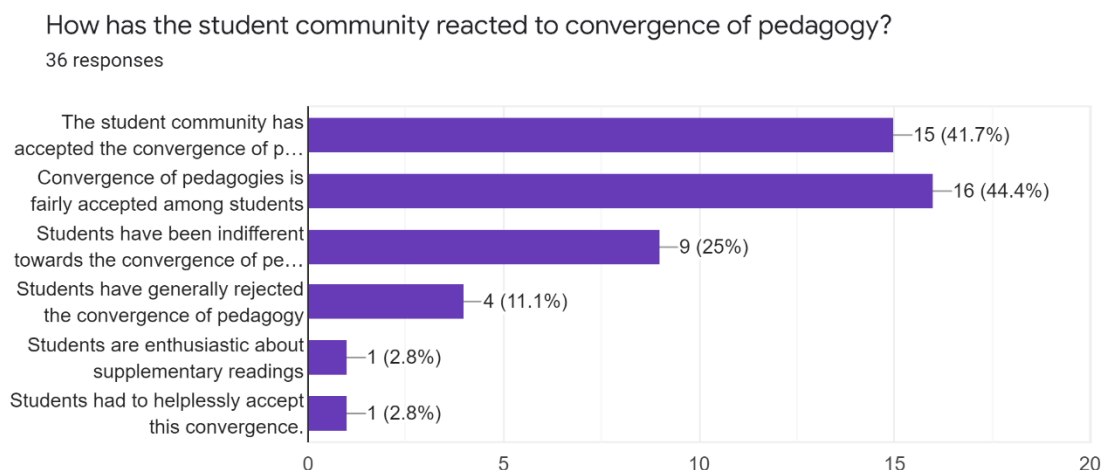
Figure 10- Response of the learners to the convergence of pedagogy

5.5.8.   **Assessment of convergence of pedagogy**

The respondents gave an overall assessment of the issue of convergence of pedagogy. These responses are summarized in Figure 11 below. It is seen that 50% of the respondents feel that such convergence has been effective and has transformed the nature of education. 27.8% of the respondents feel that the technologies used in curricular transactions alone have changed without changing the nature of the transactions. 16.7% of the participants feel that the changes have essentially been cosmetic, while other views expressed have been negligible.

What is your assessment of the convergence of pedagogy
36 responses
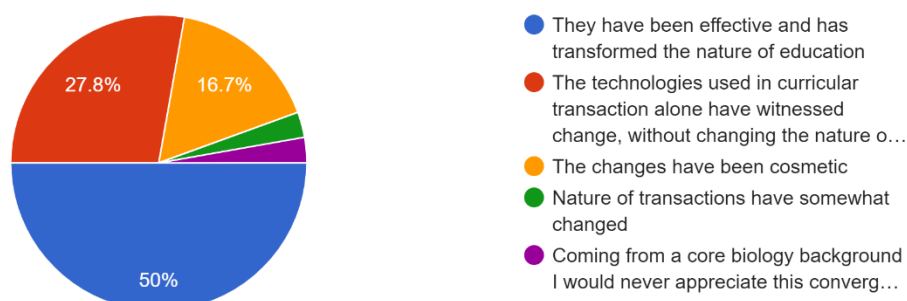
Figure 10- Assessment of the convergence of pedagogy

5.5.9.   **Potential areas in which the convergence of pedagogy can benefit the educational system**

The respondents felt that there are certain potential areas in which such convergence can benefit the educational system. These are listed below:
a.   Assignments, online classes - Examination system
b.   The use of technology for a wide range of knowledge generation
c.   AI Chatbots, Simulation, Virtual Lab Sessions, Local Language interfaces, Multidimensional and multisource data interfaces, Deep Learning, Data Mining, access to real-time databases, etc need to be embedded in the Convergence System, for a robust system.
d.   The convergence can bring more experts including industry experts to interact with students & this ultimately helps the engagement of industry with academia
e.   Convergence could result in - Development of multi-disciplinary programmes, greater student involvement and interaction, better sharing of knowledge and ideas, better use of out-of-class resources, greater use of ICT and better Storage and sharing of digital educational resources.
f.   Online Libraries

g.   For Quality Assurance
h.   Elevated educational technology knowledge among teachers, functional feedback processes, constructive online evaluation
i.   Enhancing the Interpersonal relations of students and teachers
j.   Use of online classes and assignments and use of other digital tools, Increase in asynchronous interaction between peers and teachers and learners and Acceptance of "guided didactic form of study"
k.   The convergence can bring more experts including industry experts to interact with students & which ultimately helps the engagement of industry with academia
l.   Only with increased access, and appropriate teacher development on this front can change take place. The level of mental maturity of learners for understanding and undergoing this process must be taken into account
m.   The integration of face-to-face and online learning to help enhance the classroom experience and extend learning through the innovative use of information and communications technology. Blended strategies enhance student engagement and learning through online activities to the course curriculum, and improve effectiveness and efficiencies by reducing lecture time. Learning combining the best elements of online and face-to-face education is likely to emerge as the predominant teaching model of the future.

5.5.10.   **Institutional Response to the convergence of pedagogy**

The responses received from the survey participants are represented in Figure 12 below. An overwhelming majority of the respondents feel that there has been positive support from institutional management for pedagogic convergence (86.1%), while a small proportion feels that there has been no change in the institutional policies. What is surprising to note is that only a minuscule proportion of the respondents (2.8%) feel that government policies have encouraged convergence.
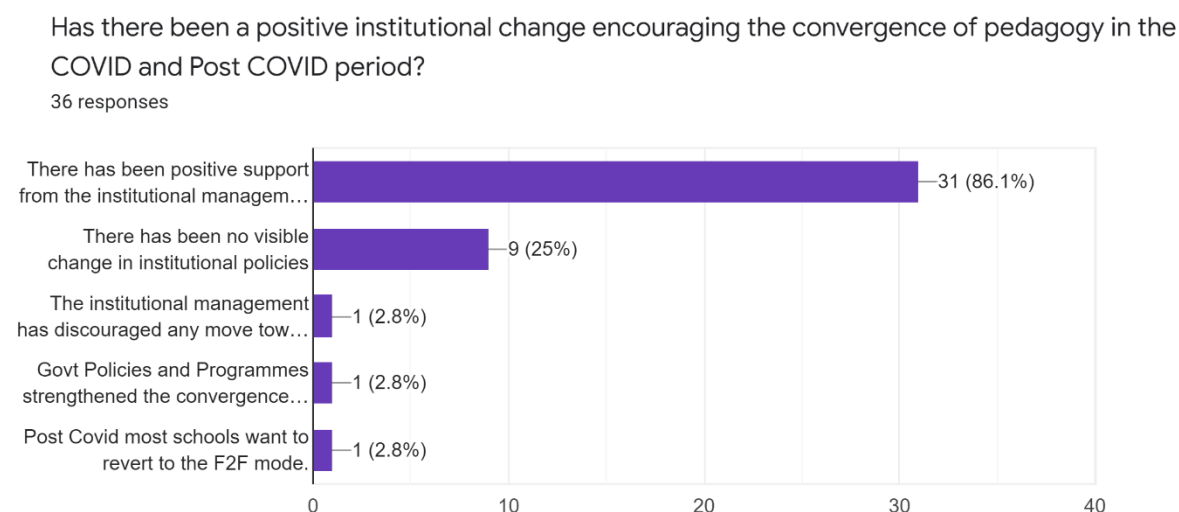
Figure 12 -Institutional Response to the convergence of pedagogy

5.5.11.   **New Education Policy (NEP) a**nd the convergence of pedagogy

A major policy document that has been discussed threadbare in recent times is the New Education Policy (NEP-2020). The researcher elicited the opinion of the respondents on the NEP and its approach to the convergence of pedagogy. The results are shown in Figure 13 below. While 41.7% of the respondents feel that the NEP supports the convergence of pedagogy, only 5.2% feel that it does not. However, a substantial proportion of the respondents (52.8%) are not sure of the approach of the NEP on this issue.

In your opinion, does the New Education Policy (NEP) support the convergence of pedagogy?
36 responses
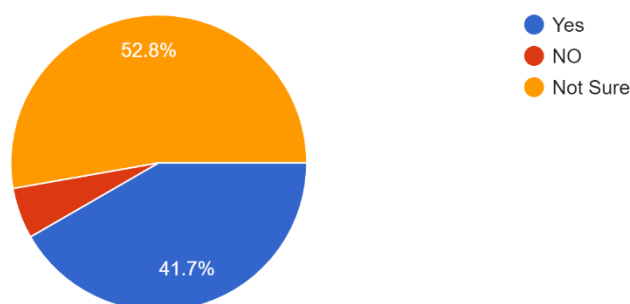
Fig-13- New Education Policy (NEP) and the convergence of pedagogy

Those respondents who felt that the NEP has supported the convergence of pedagogy feel that it has done so by

a. It is framed guidelines with the requirements of a fast-changing world. It is Student-centric and emphasis is given to developing vocational, cognitive and life skills in students. Special focus is also given to the development and usage of digital technologies in the education sector
b. NEP promotes Multiple Disciplines, Local Language Content, Life Long Learning, Flexible Curriculum, Open Learning etc
c. NEP Encourages the use of techno pedagogy
d. Integral education is encouraged by NEP
e. NEP emphasises Blended learning
f. Technology intervention and integration, Online and digital learning etc have been focused on in the NEP

5.5.12. **Suggestions for enhancing the efficacy of pedagogy through convergence**

The respondents provided several suggestions for enhancing the efficiency of pedagogy through convergence. The major suggestions are provided below:

a. For effective convergence to take place, it has to be ensured that everyone has access to technology and gadgets
b. More information has to be provided regarding the technicalities related to the operation of digital tools for learners that they use on online education portals.
c. Frequent Feedback from learners must be obtained and considered relating to the key areas of convergence
d. The digital divide may be reduced by increasing the bandwidth and reach of the internet and by making technology-based devices more affordable.
e. Appropriate pedagogy approach should be framed with a special focus on the following areas: -Development of more open educational resources, Sophisticated ICT tools for engaging students in creative and productive activities, and assessment and evaluation tools.
f. For an effective convergence system, Providing Learning Tools, flexibility, and adaptability with evolving AI, ML, NLP, Chatbots, Virtual Labs, Virtual Libraries, local language contents, multiple contents, multi-dimensions etc, need to be integrated for a robust learning convergence system.
g. Encourage credit transfer between face-to-face and distance modes. Create an umbrella arrangement to manage all required logistics regarding effective convergence
h. A short course/period of study through online or distance mode be made mandatory for obtaining a face-to-face degree/diploma. A technology preparedness course is made for face-to-face teachers. Conduct and analyse problems faced by students/teachers as they transitioned from pure face-to-face to blended/hybrid modes
i. Exposing the students as well as teachers to changing with the need of the ever-volatile economy is vital. An open book system with close mentoring of experts through online interactions can help to improve the quality of the students

6. **Discussion**

The survey has provided deep insights into the perception of teachers and educational administrators on the issue of convergence of pedagogy. If we start with the definitional aspects first, the Conventional mode of education has been defined as an instructor-centred system with key features such as crowded classrooms, instant feedback,

impersonal approach from teachers and the use of physical access devices such as boards, tables, writing aids etc Sabri Erdem (2020). The responses received from the participants of the survey too fall on these expected lines with the emphasis being on face-to-face interaction, classroom setting personal interaction and feedback etc.

Rumble (1986) presents the 7 essential elements of distance education as enunciated by Keegan as follows

a. Physical separation of the teacher and the student
b. Educational organization's influence
c. Use of technical media
d. Two-way communication
e. The general absence of group learning with the learners acquiring education as an individual unit
f. Industrialized form of education
g. Privatization of learning (education at the level of the individual)

If we look at the responses provided to the survey, it is found that these essential elements propounded by Keegan have been indirectly referred to by the respondents. The physical separation of learners and the flexibility in the study process which have been highlighted by Keegan have been alluded to by our respondents.

Hassenburg (2009) states that distance education affords several freedoms which were unimaginable under the traditional education structure. The access afforded by distance education to learners irrespective of their physical disabilities, geographic disadvantages, or financial problems gives it certain advantages over traditional education. The author goes on to mention that flexibility and convenience afforded by distance advantage marks a big difference from traditional education. Hassenburg, however, goes on to state that many of the perceived advantages of distance pedagogy have not been borne out in practice. The aspect of flexibility in distance education has been strongly highlighted by the respondents to the present survey. Some of them have stressed the innate advantages of traditional pedagogy over the distance mode.

M. Mahruf C. Shohel (2022) mentions that during the pandemic, many institutions provided emergency remote teaching and learning opportunities to tide over the challenge created by the closure of on-campus classroom sessions. The teachers were forced to adopt many new remote pedagogies to handle the situation. The authors, therefore, imply that convergence had indeed taken place during this period. In the present survey, an overwhelming majority of the respondents also felt that the convergence of pedagogies had taken place in the period, which is corroborated by the studies mentioned above.

Syahrin Syahrin (2020), states that the preferred learning styles of the learners could be encapsulated in the technologies that they used in online classrooms. Farah Otaki (2021) states that the tools of distance and online education were effective in providing seamless medical education to learners. Emiliana Vegas (2021) states that educational institutions in India had used technologies such as educational television, online classes etc to reach out to learners. The respondents to the present survey have also indicated that the preferred modes of educational institutions during the pandemic were online classes, online assignments and other digital tools, which are corroborated by research.

Li-Kai Chen (2021) has depicted a discouraging response to the convergence of pedagogy. Most of the teachers who took a McKinsey survey stated that Online education is a very poor substitute for classroom teaching. The teachers rated online education at 5 on a scale of 10. The teachers in Japan and the USA were very harsh to the extent that they ranked online education at 3 on a scale of 10. Teachers from many countries flagged the issue of lack of access to technical devices and sound internet connection as contributing to learning loss. This is quite contrary to the questionnaire results received in the present study where it is seen that most of the respondents depicted a positive inclination towards the convergence of pedagogy.

Almendingen K (2021), based on his study states that two weeks into the lockdown and the start of online sessions 75% of the learners who participated in their study felt that their life had become more difficult and further 50% of the students felt that it was now much more difficult for them in the changed circumstances to attain the curricular objectives. A further ten weeks later these percentages changed to 57% and 71%.

Mansi Babbar et al. (2021) state that the sudden outbreak of the pandemic left most educational institution management in a state of unpreparedness. The breakaway from traditional patterns created huge adjustment problems. Most institutions put their best foot forward and tried their best to minimize the impact of the pandemic through the introduction of a blend of pedagogy. The same sentiment is exhibited by the respondents of the present questionnaire. The respondents felt that the management of institutions had taken a positive approach towards the convergence of pedagogy.

The New Education Policy has in general taken a very positive approach towards the convergence of pedagogy. Two important initiatives need special mention. One is National Digital Education Architecture (NDEAR) which focuses on the creation of highly interoperable online platforms that can work efficiently from a wide variety of operating systems. The second is PM -Evidya which aims at providing an equitable education to all through multi-modal learning access to students, teachers, and parents ensuring inclusion to overcome the digital divide (GoI, 2021). The respondents to the present questionnaire have also expressed the feeling that the NEP 2020 has made a positive approach towards the convergence of pedagogy.

7. Conclusion

The study has revealed the attitude of the professionals working in the field of education towards the issue of convergence of face-to-face and distance education. It is clear that despite a large number of teething issues associated with the convergence of pedagogy, the educational community considers it the need of the hour and has exhibited a positive attitude towards the same. The students do face the problem of access, yet they too are ready to embrace the winds of change. There are several areas in which the concept of convergence of pedagogy can work wonders and these need to be worked upon in all earnest. In a nutshell. It can be stated that though the pandemic has forced upon us this convergence, it has great prospects in the coming times.

8. Limitations of the study

There are a few limitations to this study. Though the digital questionnaire was sent to a large number of academicians, only 36 of them responded. This has limited the scale of the study. Further, since the pandemic has still not come to an end, a complete analysis of the issue can be done only in a few years.

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EFFECTIVENESS OF THE BLENDED MOOC FOR PROFESSIONAL DEVELOPMENT OF TEACHER EDUCATORS

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ABSTRACT
The emergence of information and communication technology has dynamically changed the framework of higher education. With the help of MOOCs, it has provided immeasurable opportunities to massive learners to learn through open online courses. Since 2002 different types of MOOCs have emerged, like- c-MOOC, x-MOOC, NOOC, sMOOC, and a hybrid MOOC/ blended MOOC. B-MOOCs have arisen as a blended learning strategy which is the combination of MOOC platform-supported activities and face-to-face activities within the class in Higher Education contexts.
This paper presents the strategies to analyse the effectiveness of a blended MOOC for the professional development of teachers. This research was conducted using mixed-method research. Qualitative and quantitative tools were used to collect data.
Keywords: MOOC, blended MOOC, teachers, professional development, effectiveness.

Introduction
In the last few years, there is an exponential growth in Massive Open Online Courses (MOOCs) in every field of education. MOOCs have the notable ability to provide access to free online education to a large number of learners from all over the world. MOOCs have best suited for lifelong learning for those, who want to learn on their convenience for those who are working full time and do not get the time due to personal involvements for self-study or have taken a break from formal education. Though MOOCs are very popular but there are concerns and questions regarding the usability of MOOCs (Yousef, 2015). Still, most of the MOOCs are following a teacher-centred, top-down, controlled and centralized learning model rather than a student-centred, decentralized and bottom-top model. Moreover, the lack of interaction between teacher/ instructor and students/ learners is missing in many existing MOOCs. Other challenges of MOOCs are pedagogical concerns, methods being used and techniques of assessment, very less interaction between the learners and between instructors and participants, as well as the lack of technological expertise as also the diversity of MOOC participants. For many participants language as well as the absence of face-to-face interaction among participants and between participants to instructors are also major barriers in MOOCs. All these challenges raise questions on the role and design of MOOCs.

All these concerns give rise to the new design paradigm of Blended MOOC in which the main focus is on a learner-centred approach rather than a teacher-centred one. It overcomes the challenges faced in the other MOOCs by including class (face-to-face) interactions and online learning components, interactive video lectures, various effective assessment methods and feedback as well as caters to the participants from diverse perspectives in a single classroom (MOOC) environment. Ostashewski & Reid (2012); Bruff, et al. (2013); Ghadiri et al. (2013) have stated that blended model can resolve some of the challenges of MOOCs. There are studies suggesting to integrate bMOOC in higher education (Loviscach, 2013; Griffiths et al., 2014; Sandeen, 2013). However, so far very few studies have been conducted to highlight the effective design of blended MOOC environments for the professional development of teachers.

Blended MOOC
Blended Massive Open Online Courses (bMOOCs) has emerged as a new paradigm involving the blended learning strategies in which MOOC platform-supported (online) activities and video-based content with in-class (face-to-face) activities are combined to use in Higher Education contexts (Albo, L., Leo, D.H. & Oliver, M. (2015). There are three models of blended learning which are being used in many blended MOOCs, viz. "blended presentation and interaction" "blended block" and "fully online". Wo and Luo (2022) found that students are having a positive attitude towards bMOOCs as they found it highly interactive, flexible. This helped in developing a better understanding of content.

The MOOC developed in the present study has followed the **'fully online'** model of blended learning in which all the learning activities were designed online. The interaction was through live sessions and discussion forums.

The theoretical framework of Blended MOOC

There are various theories associated with blended learning. For developing the present MOOC on **'Plagiarism: Concept and Precautions'**, the researcher has followed the Community of Inquiry Framework.

The community of inquiry (COI) framework was proposed by Garrison, Anderson and Archer in 2000. It focuses on inquiry-based teaching and learning, which supports the constructivist views of experiential learning. This inquiry-based teaching-learning approach believes in providing meaningful engagement of learners rather than direct instructions about content. (Cleveland-Innes, 2017)

The CoI framework highlights the presence of three necessary elements i.e., *cognitive presence, teaching presence and social presence,* which are essential making the educational experience effective in blended mode.

Cognitive presence is "the extent to which learners can construct and confirm meaning through sustained reflection and discourse" (Garrison, Anderson & Archer, 2001). Cognitive presence represents itself with the help of four components, i.e., triggering events, exploration, integration and resolution. Teaching presence is defined as "the design, facilitation and direction of cognitive and social processes for the realization of personally meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison and Archer, 2001)." Short, Williams, & Christie, (1976) argued that different forms of media vary in their capacities to transmit "social presence". **Social presence** is "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities." (Garrison, 2009)

In the present MOOC, the researcher has ensured the presence of all the three elements by facilitating the following components:

S.No.	Elements of CoI Framework	MOOC on Plagiarism
1.	Cognitive Presence	Hands on activities, quizzes, terminal assignment (hands on practices) were included, well organized content was provided, reflections in the discussion forum were elicited.
2.	Teaching Presence	Communicated all the necessary information about the course, course goals and objectives were clearly explained, queries were solved in discussion forum, the discussion forum was continuously assessed and the feedback was provided, live sessions were organized on various topics to facilitate participants
3.	Social Presence	Participants were given chances to express their views in the discussion forum, and they were free to comment/post on other's post, there was enthusiastic participation in the interactive live sessions.

Table 1: Components of MOOCs

By following the above elements in the MOOC, the researcher ensured the presence of all the three components of the Community of Inquiry Framework.

Need and Justification of the Study

Most of the studies found MOOCs effective for pre-service training. Offering MOOCs for the professional development of in-service teachers were also found to be a cost-effective programme, in terms of time, training and coaching, administration, material, facilities, travel, transportation and conference fees of teachers and organizers. (Odden & Archibald, et. al., 2002). After using MOOCs for professional development, the teachers can use this knowledge in their classroom.

So, there is a need to train the existing higher education teachers periodically to keep them updated with the latest pedagogies, content, skills required for facilitating the new-age learners. (AISHE, 2018).

University Grant Commission (UGC) has taken the initiative to fulfil on-going professional development needs to train the teachers by holding short-term professional development courses, Inter-Disciplinary Refresher Courses, Orientation Courses, Panel Discussions, Seminars, Workshops, Guest Lectures, etc. on a regular basis conducted by 66 Academic Staff Colleges (ASCs) or Human Resource Development Centres (HRDC) located all over India. (UGC-HRDC, n.d.)

There are a few studies like Zakaria, et. al. (2019) conducted to assess the effectiveness of blended MOOCs, and found a significant differences in academic achievements of experimental and control groups. They concluded that MOOCs are more effective than a traditional classroom for the new generation who are tech-savvy. The MOOC model of the present study has also supported the idea of Morris (2014), who stated that "MOOCs are offered for students to enhance their learning and personalized learning environments". There are researchers like Griffiths et al., (2015), who have highlighted the benefits of integrating MOOCs in traditionally taught courses. Koller, Ng, Do, & Chen (2013) have highlighted that integrating MOOCs with the face-to-face mode of teaching helps increase the course completion rate, however, there are high dropout rates in MOOCs. Garrison & Kanuka (2004) advocated activities may be integrating in both, synchronous and asynchronous mode to strengthen the blended MOOCs.

A study in this area was felt to assess the needs of professional development of higher education teachers as well as their ease of access in getting trained through MOOCs for their professional development. It was felt pertinent to gauge their perception about themselves in terms of their digital fluency, enough, to learn through MOOCs. These questions need to be answered. Hence, the investigator felt the need to develop the MOOC for the professional development of teacher educators and to study the effectiveness of MOOC for the training of teacher educators.

Statement of the Problem
"To Study the Effectiveness of Blended MOOC for Professional Development of Teachers Educators". The problem taken for the study includes the development of a blended Massive Open Online Course for Professional Development of teacher educators and to study its effectiveness.

Operational Definitions
BLENDED- MASSIVE OPEN ONLINE COURSE (B-MOOC)
"Blended MOOC is referred to a course which was developed and offered by the investigator for the professional development of teacher educators on a free and open MOOC platform (Canvas) having both online and face-to-face activities"

PROFESSIONAL DEVELOPMENT (PD)
For the present study, *Professional Development refers to the process of improving and increasing knowledge or making the teacher educators abreast with recent developments in the field of education, working in DIETs/colleges/universities through MOOC.*

TEACHER EDUCATORS
Teacher Educators can be defined operationally for the study as '*the faculty members teaching in university departments of teacher education or affiliated colleges/institutions and are responsible for professional teacher preparation at elementary/secondary and senior secondary level.*

DEVELOPMENT
For the present study, *'the researcher has developed a blended massive open online course for professional development of teacher educators and offered on Canvas platform.'*

EFFECTIVENESS
For the present study, "*effectiveness has been measured in terms of achievement scores of pre-test and post-test on plagiarism, completion of a terminal assignment, the experience of the participants towards using MOOCs of teacher educators before and after completing the course.*"

Objectives
The major objectives of the present study were:
- To develop a blended-MOOC for the professional development of teacher educators.
- To analyse the effectiveness of a blended-MOOC for the professional development of teacher educators.

Research Design

The present study has focused on developing the Massive Open Online Course (MOOC) and testing its effectiveness for the professional development of teacher educators. For which the first researcher has identified the area to develop a MOOC for professional development, developed the MOOC on **"PLAGIARISM: Concept and Precautions"**, offered it and studied the effectiveness of MOOC using **Mixed Method Research.**

For the present study, to achieve the different objectives of the research, the researcher has followed the **'quan→QUAL'** research design. (Johnson & Christensen,2012). The researchers used **one-group pre-test-post-test experimental design**.

Population

The present study involves enrolment through the MOOC platform and anyone can join the course. Therefore, a **numerical description of the population is not possible in this study. All the teacher educators in India constitutes the population for the study because no institutional, territorial jurisdiction of the university or state was fixed for the study.**

Sampling Technique and Sample

Being mix-method research involving MOOC on an open platform, traditional sampling techniques were not possible to use for this research. Therefore, the researcher has applied **an Identical sequential mix sampling design.** In this design, Quantitative and qualitative data are collected one after the other (i.e., sequentially) on the same participants who are selected to represent the same population under investigation (i.e., identical relation) *(Johnson and Christensen, 2012, p. 238)*

For the present study, those teacher educators who have filled the questionnaire before and after completing the course, only those have considered as a sample.

Total 1548 participants enrolled themselves in the course, out of which 303 participants, who are teacher educators completed the course with all modules. So, the sample for the present study is 303.

Tool for Data collection
Pre-test-post-test

To analyse the effectiveness of the MOOC programme for the professional development of teacher educators, pre-test and post-test was used. There were 30 items in the test based on the five modules of the course. Participants were given only one attempt to fill the pre-test. The number of items in the pre-test and post-test was the same. Equal weightage was given to all the modules in selecting the questions for pre-test and post-test. The five modules are understanding plagiarism, types of plagiarism, plagiarism detection software(s), practices to avoid plagiarism and UGC regulations, 2018 for curbing plagiarism.

The test items were validated by nine experts from different universities. Reliability was calculated by the test-retest method. The reliability of the test is .84. The test (pre-test) was given to the participants before starting the course and after 42 days in the form of a post-test after completion of the course. During offering the course the link of the pre-test was made disabled so that participants could not see the items and their responses.

Post-course Survey

At the end of the course, participants were expected to share their opinion and views on various components of the course as well as on the structure and design.

The post-course survey aimed to collect participant's feedback on the course PCP MOOC. The outcome of this helped in analysing the effectiveness of the course/modules.

The items in the tool belong to the following sections- course information, course design and organization, interaction and collaboration, assessment and effectiveness of Massive Open Online Courses (MOOCs), course content, and feedback on modules etc. Participants were given four choices, strongly agree, agree, disagree and strongly disagree to share their views based on their experience and on feedback on the modules they were expected to rate on a scale of 5 to 1 on every component of the modules of the course. 5 stands for most satisfactory/strongly agree and 1 for the least satisfactory/strongly disagree.

Validity and Reliability
Reliability
For the standardization of tools, the test-retest reliability has been calculated. The test-retest coefficient of correlation of 75 participants who appeared for both the tests was calculated and found to be 0.874 which shows a significant correlation at 0.01 levels.

Validity
All the tools were sent to the nine experts who belong to central and state universities. The experts suggested modification to the statements after due consideration of the objectives of the study (the wording of the statements and sequencing of the statements). All the changes recommended by the experts were incorporated and the draft of the final tools was prepared.

INTERPRETATION OF DATA
Analysis of the Objective 1
To analyse the effectiveness of a MOOC for the professional development of teacher educators in terms of their performance in pre-test and post-test.

HYPOTHESIS
In order to test the above objective, the researcher has administered an achievement test comprising items related to all the five modules of the MOOC, which was on offer.
The following hypothesis was tested statistically:

H1: There is a significant difference between pre-test and post-test scores of teacher educators before and after exposure to Massive Open Online Course (MOOC).

t-Test: Two-Sample Assuming Unequal Variances		
	pre-test	*post-test*
Mean	13.37	18.64
Variance	22.45	20.77
Observations	292	292
df	581	
t Stat	**13.69**	**Significant at 0.05 level of Significance.**
t Critical two-tail	1.96	

Table 2: Hypothesis Testing

H1 was the main hypothesis of the experiment. To test this hypothesis, the experiment was conducted with a single group pre-test and post-test design and data were collected using a standardized achievement test. As the hypothesis is a non-directional hypothesis, a two-tailed t-test was used.

The t-stat value is calculated as 13.69, which is more than t-critical (1.96) at 0.05 level of significance for the degree of freedom 581. This leads to the acceptance of hypothesis H1. It can be inferred from this finding that the experimental intervention i.e. the MOOC for Continuous professional development has contributed significantly to increase the achievement of participants in course content.

This analysis shows that the experiment i.e., offering a MOOC on Plagiarism has significantly increased the conceptual understanding of plagiarism, understanding of types of plagiarism, knowledge of plagiarism detection software, practices to avoid plagiarism and the knowledge of regulations to avoid plagiarism in India among the teacher educators.

These findings are reflecting that MOOC is an effective tool for the professional development of teacher educators as the experiment has significantly increased the scores of participants after exposure to the course.

POST-COURSE SURVEY DATA
Participants were asked to fill the post-course survey after completion of the course. Total 308 participants were responded to the post-course survey after completing the course.

The responses of the participants on the statements of the first section reflect that the course design was well understood by the participants. The information of the course was well communicated by the instructor. All the learning objectives of the course were achieved successfully. All the instructions for completing the task (activities, quizzes and discussion forum) and navigating the course were given clearly. It reflects that the course was well planned by keeping the diverse needs of the participants in mind.

The responses on statements of the second section reflect that the course design was well understood by the participants, the course was well organized. The content was presented in small chunks in each module, videos were relevant to the content, activities helped the participants to clear doubts. The course content was up to date. Participants were satisfied with the updated information about plagiarism.

The responses of the participants in section three reflect that the interaction of the instructor with the participants was good. The instructor helped the participants to solve their queries as soon as possible. Participants learnt collaboratively in this course by sharing their views in the discussion forum. There were quality discussions in the forum which enhance the understanding of the participants through each other's experiences.

It reflects that during the course variety of methods are used for assessment in between the course as well as at the end of the course. Which helped the participants to assess their learning or understanding. Activities and quizzes helped the participants to analyse their performance or learning. For the terminal assignment, clear instructions were provided to complete the task and the terminal assignment was based on reflective learning in which participants were supposed to apply all the skills/ techniques, that they have learnt in the course to complete the terminal assignment.

Overall, participants were satisfied with the course content. The course followed a modular approach. Each module was started with a module introductory video which gave the overview of the module, explained the objectives of the module, activities and conditions for the quiz. In between the module, the content was facilitated with the videos which were helpful to understand the concept to the participants. At the end of the module, there was a module-end quiz, which helped the participants to assess their understanding. After each module, a module summary was provided to the participants to quick recapitulate the complete module which was very helpful to understand the concept. So, most of the participants were completely satisfied with the course content and with the design of the modules.

Findings and Discussion
The analysis of tools shows that participants of the 20-59 years of age group were enrolled in the course. As well as there was a mixed group of participants from various disciplines (majority teacher education). They got the information about the course through social media. Before attending the course, they were not much aware of plagiarism.

To analyse the achievement of the participants, they were given the pre-test before starting the course and the same post-test after completion of the course. The result of the pre-test and post-test shows that there is an increase in the scores of the post-test of the participants after completion of the course. The achievement in the scores was on understanding plagiarism, types of plagiarism, plagiarism detection software, practices to avoid plagiarism and regulations on plagiarism in India.

After completion of the course, the researcher collected data through a post-course survey to study the experience of the participants attending the course. The data shows that participants had a good experience of attending the course. The responses showed that the information given in the course was clear and appropriate, learning objectives were achieved successfully and clear instructions were given in the introductory module to navigate in the course and to perform the activities and attempt the quiz. The course was well designed and organized, course activities helped the participants to clear doubts, the course content was available in small chunks, the course content has filled the expectations of the participants. Interaction and collaboration in the course were good. The instructor solved most of the queries regarding the course, announcements were made from time to time to disseminate the information. Various methods were used in the course for assessment. Participants strongly agreed on the section that reflects that MOOC is an effective medium for PDP of teachers/ teacher educators. Overall, the course was effective, modules were well designed and content in the modules was useful in participants' academic work.

Implications

MOOCs have changed the teaching-learning scenario worldwide. Now the learning has become life-long learning irrespective of age, demography, distance, eligibility criteria etc. the implication of MOOCs in different fields can be highlighted in the following points:

- Many universities across the world are using MOOCs, particularly xMOOCs to deliver quality content either freely or at minimal cost;
- Most of the MOOCs are open, only the learner requires a computer with internet;
- MOOCs is useful for accessing high-quality content offered from the best universities in the world.
- MOOCs are useful for developing basic conceptual learning.
- MOOCs also help in developing online large communities of interest or practise;
- MOOCs have given a chance to many conventional institutions to reappraise or redesign their teaching-learning strategies utilizing avenues of online and open learning;
- Irrespective of many concerns and challenges MOOCs is the best medium for the professional development of teachers.

MOOCs have emerged as an opportunity as well as an alternative to traditional distance and open education. The traditional lecturing has been replaced by more facilitative and guided approaches to education. Many students are getting attracted towards MOOCs due its flexibility and less cost. As stated by Yuan and Powell (2013) *"Within the movement towards open education, this new paradigm opens up opportunities for sharing ideas, collaborating between institutions, educators and learners locally and internationally, and facilitating more meaningful engagement in teaching and learning."*

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E-LEARNING IN THE CLASSROOM: A TEACHER'S PERSPECTIVE ON E-LEARNING READINESS AND ADOPTION

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ABSTRACT
This study aimed to ascertain teachers' readiness to embrace the opportunity of E-learning. The researchers utilized the approach of descriptive research. The study gathered data from school teachers, who completed a questionnaire as part of the data collection process. A questionnaire was developed to collect data qualitatively and quantitatively. The key factors were derived from (Akaslan & Law, 2011; Aydin & Tasci, 2005) models of E-learning readiness. Along with demographic data, the questionnaire focused on four key factors: technology, innovation, personnel, and E-learning training. The teachers graded their available resources, skills, and attitude on a 5-point Likert scale, and qualitative data were also gathered. Teachers appear to have embraced the integration of E-learning in their pedagogy. However, some raised concerns regarding institutional support and technological use. Additionally, they believe their school is prepared to undertake E-learning but requires minor improvements in the matters of technology and personnel. This study will have an impact on teachers, students, and the institution as a whole. The study's findings may serve as a reflection for the institution in terms of considering how to sustainably incorporate E-learning into schools and in terms of understanding teacher requirements.
Keywords Online learning, Educators, measuring readiness, innovative teaching, E-learning Training

INTRODUCTION
Education around the world has seen several rapid changes. The greatest dramatic change has occurred in the way technology is used. Society has become more globalized, and digital technology has permeated the educational system (Mynbayeva *et al*., 2018). Students now stay connected internationally and have access to information in the palm of their hands thanks to the Internet and technological advancements (Cardoza & Tunks, 2014).

Since the pandemic, learners worldwide have been impacted by school closures and other educational institutions. We have been repeatedly reminded of the critical role of world teachers throughout this historic period. Without them, it would have been difficult to envision the world's education. However, some studies assert that teachers were unprepared for the new mode of instruction delivery, as the majority of teachers were unaccustomed to these unexpected situations. Teachers would have struggled, but they would never have jeopardized education. We should recognize and celebrate their achievements. While school closures were undoubtedly detrimental to society, teachers learned, experimented, improvised, and discovered several methods to increase their students' educational reach. Due to the terrible pandemic condition, the reliance on technology has expanded dramatically. The pandemic has compelled educational institutions to re-examine the necessity of E-learning or hybrid-blended teaching as the only viable option for conventional face-to-face instruction. A lot of nations have created ways of using E-learning in education. According to the Global Learner's Survey (2020), E-learning played a significant role in the experiences of learners of all ages as a result of the pandemic. In light of this fact, it is clear that there is a pressing need for increased investment and enhanced use of educational technology; i.e., if online education is here to stay, students deserve a better experience (Pearson, 2020), which indicates the concern for quality. The pandemic has forced the majority of schools worldwide to transit to E-learning, while some have opted for a hybrid/ blended model. Concerns about quality are a significant factor in this respect. The teacher's readiness is a critical component to consider while determining the education quality.

Considerable research has examined and quantified the readiness aspects that impact online learning efficacy in education. According to Dogbey et al, E-learning education is a collaborative effort aimed at facilitating and enhancing meaningful engagement among students, teachers, and resources (Dogbey et al., 2017; Siemens &

Irvine, 2013). The knowledge and skills acquired via face-to-face teaching are inadequate for E-learning. Additionally, Gray and Tobin demonstrate that online learning promotes teaching approaches that do not require textbooks and may reach a large number of students, thus overcoming space and time constraints without requiring additional resources except technological resources (Gray & Tobin, 2010). These conditions have not only compelled teachers to experiment with several innovative approaches, but it has also presented them with an opportunity to develop their competencies on an E-platform. Teachers play an important role in the educational process, so this study investigates their perspectives and perceptions of their readiness for E-learning educational opportunities.The goal of this study is to show how teachers are adopting digital trends and what they think about the future of education.

Innovative teaching Methodologies
Teachers' active utilization of innovative teaching methodologies is a must in the modern day (Mynbayeva et al., 2018). It is critical for instructors to strengthen their digital abilities and receive enough training in pedagogical techniques appropriate to E-learning. The use or non-use of innovative methods is contingent upon the teacher's personality, methodological competency, and pedagogical skills. Teachers who don't know how to use the most up-to-date technology or software often don't have the confidence to use technology in the classroom, which can lead to them not wanting to use technology in the classroom. Teachers say they have high technical skills for the personal use of technology but lack the skills and knowledge to integrate technology into teaching and learning (Al-Awidi, H.; Aldhafeeri, 2017). Teachers are capable of in-depth reflection on their experiences. Thus, the current assessment of readiness was conducted from the perspective of a worldwide teacher's experience.

Teacher's Readiness
Readiness is a difficult concept to grasp, thus it should be given the utmost consideration. For someone to be considered "ready," several factors must be taken into account. The teacher plays a critical part in the proper implementation of any learning strategy, and its success is strongly dependent on the ability of teachers to seamlessly shift from their traditional classroom duties to the broader, more complex position of E-learning facilitators (Comas-Quinn, 2011).

Research on their readiness for change can help explain teachers' attitudes and behaviors in this particular context. "The cognitive precursor to the actions of either opposition to, or support for, a change endeavor" might be defined as "readiness" (Mansor et al., 2021). Having the knowledge, talent, or capacity to perform a certain skilled task swiftly and as per industry standards constitutes one's level of competence (Richey et al., 2001). Education providers are ready when they have the necessary skills and mindset to succeed in their goal of providing quality education to students. The learning experience of students depends heavily on the teacher's readiness, which includes their attitude, training, and behavior (Zimmerman et al., 2020).

Technology as E-learning Competency
Technology is the key component in E-learning. Apart from other key factors such as computers and the internet, technological readiness is defined by two components: hardware and software (Akaslan & Law, 2011). Efficient technological abilities, when combined with unique pedagogical skills, not only enhance the competency of the teacher but also create an interactive teaching-learning environment. Teachers' willingness to use technology in their classrooms is a critical influencing element that has a significant positive impact on the integration of technology into education (Inan & Lowther, 2010). Teachers' readiness to adapt and their attitude toward technology are two of the most important factors in the successful integration of technology and its effective usage in education (Cavas et al., 2009).

Innovation as E-learning Competency
As a component, innovation entails a thorough evaluation of prior experiences. Rogers asserts that prior experiences with innovation in a system may potentially influence the acceptance of a new one (Rogers, 2003). Whether or not a teacher is open to E-learning can be inferred from their attitude toward innovation. Thus, the readiness questionnaire includes multiple questions concerning the acceptability of innovative technologies. Having a solid foundation in digital media and learning new skills, responsibilities, professional development, and attitudes regarding technology integration are essential for teachers who plan to teach online (Ruggiero & Mong, 2015).

Personnel as E-learning Competency
While learning during the pandemic era has been difficult for both students and potential teachers, this period of upheaval has provided a chance to rethink and reimagine preparation as well as education itself (Darling-Hammond & Hyler, 2020). The school is responsible for providing a support structure for teachers. Support from both within and beyond the school is critical. Barnett Berry (2020) stated that the pandemic would demonstrate that if teachers

are to give such support, they must have additional time to collaborate with other professional experts (Berry, 2020). The personnel factor is concerned with the characteristics of the institution's total human resources. Additionally, Rogers (2003) notes that those with a greater degree of education are more likely to accept an invention than those with a lower level of knowledge (Rogers, 2003). Thus, teacher education levels can be utilized as a predictor of e-learning readiness.

Training as E-learning Competency
Additionally, as part of the process of determining how individuals in schools help teachers, it is thought necessary to determine if individuals in schools require E-learning training. Providing training is another pursuit of the school. E-learning training is important for E-learning readiness and should be part of the process of deploying E-learning (Akaslan & Law, 2011).

Strong teacher training that improves teacher efficacy and retention is more critical today than ever (Podolsky et al., 2016). A consistent vision, well-defined criteria, and the modeling of research-based, successful practices are required for high-quality teacher training programs (Darling-Hammond & Hyler, 2020). It should also reflect contemporary educational goals. Teachers' perceptions of online teaching competence improved with professional development programs (Northcote et al., 2015).

Resources, Skills, and Attitudes
Teaching competencies are evaluated in terms of resources, skills, and attitude. Knowledge is classified as a skill, whereas habits are classified as an attitude. When combined with resources, they constitute a construct.

Resource construction is critical in terms of instructional materials, core technical frameworks, and the provision of information technology services. An E-learning school must have an acceptable modern essential infrastructure in order to provide its services. When teachers and students have access to appropriate and updated innovative resources, communication, assistance, information technology, and others, support becomes simpler. As a result, resources, technology, and information technology may all contribute to the success of E-learning. It must also include a resource center for supporting effective E-learning teaching and learning. E-learning education requires teachers, managers, and support staff to be well-qualified, well-trained, and well-equipped to help students accomplish their learning goals.

Attitudes are the viewpoints that individuals might take in response to a transformation process (Van den Berg, 2002). Attitude refers to a person's perspective on something and its personal significance to them (Krosnick & Petty, 2016). It is critical to assess teachers' views on the significance of various E-learning abilities. Teachers who are supportive of online course delivery are more capable of attaining excellent student results (Volery & Lord, 2000).

In summary, readiness for e-learning may be assessed by looking at its resources and teachers' and leaders' skills and attitudes. These variables encompass technology, innovation, personnel, and e-learning training.

RATIONALE
Despite the abundance of literature on E-learning education, many aspects of it still remain understudied (Bocchi et al., 2004; Zhou et al., 2020). According to Academic Exchange Quarterly (Wray, M., Lowenthal, P. R., Bates, B., & Stevens, 2008), there is a lack of studies on teachers' readiness and attitudes toward online instruction. For the connection of teachers and students across the world, providing a worldwide online education vision is crucial. Even if the infrastructure and other resources were limited during the pandemic, the teachers' function in E-learning education was notable. The teachers' ability to adapt their teaching methodologies and take on new tasks is critical to their E-learning readiness. Here, the presented study seeks to reveal important online teaching skills and technical training needs.

E-learning in schools demands specific skills. To measure teacher training and development requirements, the research will produce a rapid reckoner for E-learning abilities. The study aims to improve teacher competencies and their usage in E-learning education.

OBJECTIVE
This study's primary goal is to establish whether or not schools throughout the world are adequately equipped for E-learning in the view of assessing teacher's readiness. As a result, the study question was constructed as follows: How do teachers view their readiness to integrate E-learning into their classrooms?
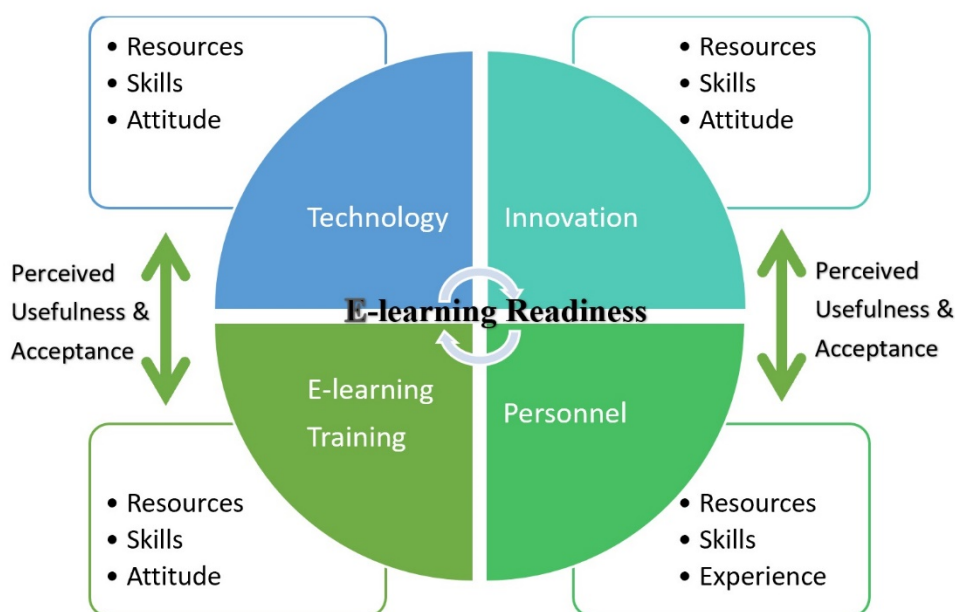
METHODOLOGY

Research Design

The survey-based research was performed using an electronic questionnaire. In descriptive research, the survey approach is frequently used to obtain data on an individual (Johnson, Burke & Christensen, 2014).

Respondents

The survey was distributed online using Google Forms to 50 randomly selected school teachers worldwide, with 33 responding to the questionnaire, 29 (87.9%) of whom were female and 4 (12.1%) of whom were male. The questionnaire received a response rate of 66%. Respondents were from India, the United States of America (US), the United Arab Emirates (UAE), Finland, and Pakistan, with India accounting for the biggest share, i.e., 69.7% (Refer Table 1).

	Frequency	Percentage (%)
Gender		
Female	29	87.9
Male	4	12.1
Total	**33**	**100**
Country		
India	23	69.7
US	3	9.1
UAE	3	9.1
Finland	2	6.1
Pakistan	2	6.1
Total	**33**	**100**

Table 1: Distribution of Respondents by Gender and Geographical Location

Data tool and procedure

The researchers constructed a teacher readiness questionnaire by conducting an extensive literature review and customizing and classifying items according to the Aydin and Tasci model of e-learning readiness (2005) and Akasalan & Law (2011) (Refer Figure 1).

Figure 1: E-learning Readiness Model (adapted from Aydin & Tasci (2005) & Akasalan & Law (2011)
The questionnaire includes both open-ended and closed-ended questions, with an emphasis on maintaining respondents' anonymity. The survey asked about respondents' readiness in four areas: technology, innovation, personnel, and e-learning training. Quantitative data was collected on a total of 37 items representing technology, innovation, and personnel. Additionally, the questionnaire included five open-ended questions to assess E-learning training and three open-ended questions, one for each of the following areas: technology, innovation, and personnel. The open-ended questions elicited qualitative data on their perceptions, practices, and future visions.

Knowledge (specific to the subject) was not examined because the researcher's objective was to measure just readiness for E-learning. In the following step, the questionnaire was uploaded to a Google form and sent to instructors via email and social media sites such as WhatsApp and LinkedIn to collect data.

The majority of the questionnaire's items were rated on a five-point Likert scale, with "Strongly Disagree" and "Strongly Agree" serving as the extremes. Certain things received alternate descriptions such as: never, rarely, not sure, occasionally, and always. These options were arranged in a way that makes it easy to group responses into five-point Likert categories. According to Aydin and Tasci (2005), a projected level of readiness for E-learning may be determined by a mean score of 3.40, with the items revealing greater and lower levels of readiness. The Likert scale includes 4 intervals and 5 categories, and the ratio of 4 intervals to 5 categories is 0.8, thus the predicted degree of readiness is 3.40 *(Refer Figure 2).* The Aydin & Tasci readiness measurement scale (2005) was followed throughout.

Data Analysis
Demographic and item-level descriptive data (means and standard deviations) were presented. Open-ended questions were part of E-learning training that was qualitatively examined. Cronbach's alpha was used to check the internal consistencies of the three items, viz., technology, innovation, and personnel.

The data was interpreted and analyzed using the following statistical tools:
1. The frequency count and percentage are used to ascertain the total number of respondents according to their
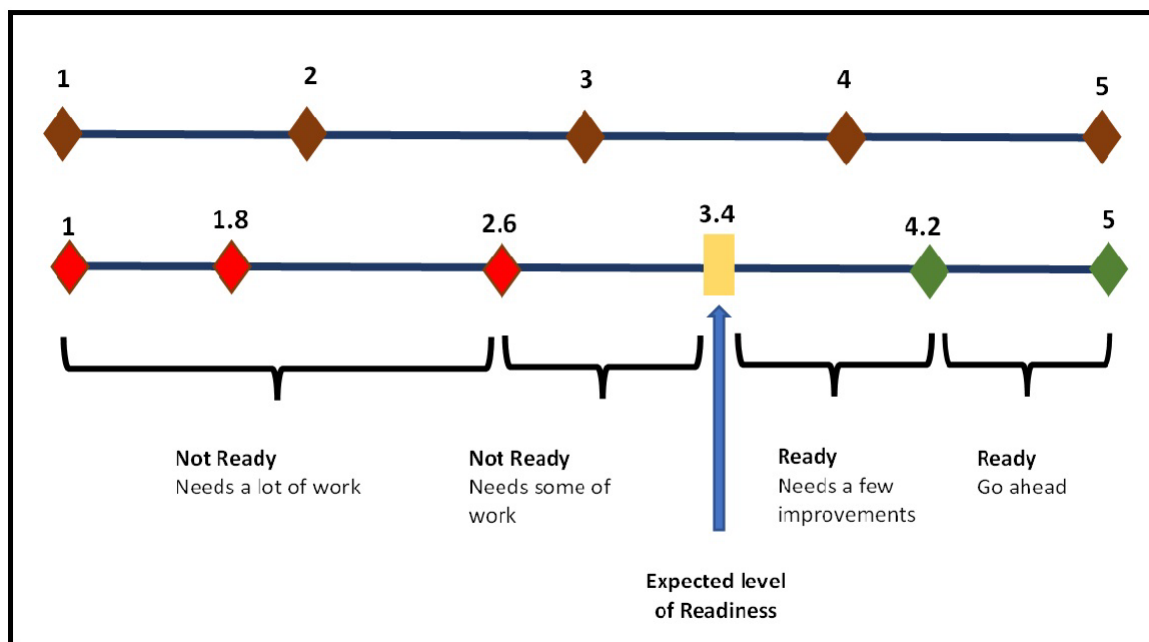
Figure 2: Aydin and Tasci measurement scale

2. The teacher's readiness for e-learning was determined by the mean.
3. The Aydin and Tasci Measurement Scale (2005) was used to determine the level of readiness.

RESULTS & DISCUSSION
Reliability of the Survey Questionnaire
Cronbach's alpha was used to measure the internal consistency (reliability) of the respondent's responses to the survey, the value of which should be 0.70 or greater for all constructs. Cronbach's alpha values for technology, innovation, and personnel were 0.70, 0.82, and 0.86, respectively.

Demographic Profile of the Participants

	Frequency	Percentage (%)
Age (in years)		
18-24	0	0
25-34	4	12.1
35-44	18	54.5
45-54	10	30.3
55-64	1	3.0
65 and above	0	0
Total	**33**	**100**
Educational Level		
Undergraduate	0	0
Graduate	5	15.2
Postgraduate	23	69.7
M Phil/ PhD	5	15.2
Others	0	0
Total	**33**	**100**
Experience (in Years)		
1-5	5	15.2
6-10	11	33.3
11-15	10	30.3
16-20	4	12.1
21-25	1	3.0
26-30	0	0.0
31 years and above	2	6.1
Total	**33**	**100**
Additional Teachers Training (NTT, PTT, B. Ed, M.Ed, etc)		
Yes	27	81.8
No	6	18.2
Total	**33**	**100**
Grade Level		
Preschool	4	12.1
I-III	3	9.1
IV-V	9	27.3
VI-VIII	7	21.2
IX-XII	10	30.3
Total	**33**	**100**

Table 2: Respondents' Demographics

Table 2 shows the teachers' profiles. The majority of teachers (54.5%) were between the ages of 35 and 44; 69.7% were postgraduates, 15.2% were graduates, and the same number of teachers had MPhils or PhDs. M.Ed., NTT PTT is held by 81.8% of them. In terms of teaching experience, 33.3% have 6–10 years of experience, while 30.3% have 11–15 years. They all taught online for at least a year; 22 of them taught exclusively during the pandemic; 11 of them later transitioned to blended and face-to-face teaching. 30.3% of teachers teach grades IX-XII, while 27.3% teach grades IV-V.

With regards to the preferred form of instruction, 81.8% of teachers chose face-to-face teaching as their first preference, whilst E-learning was regarded as the last choice by 57.5% *(Refer Figure 3)*.
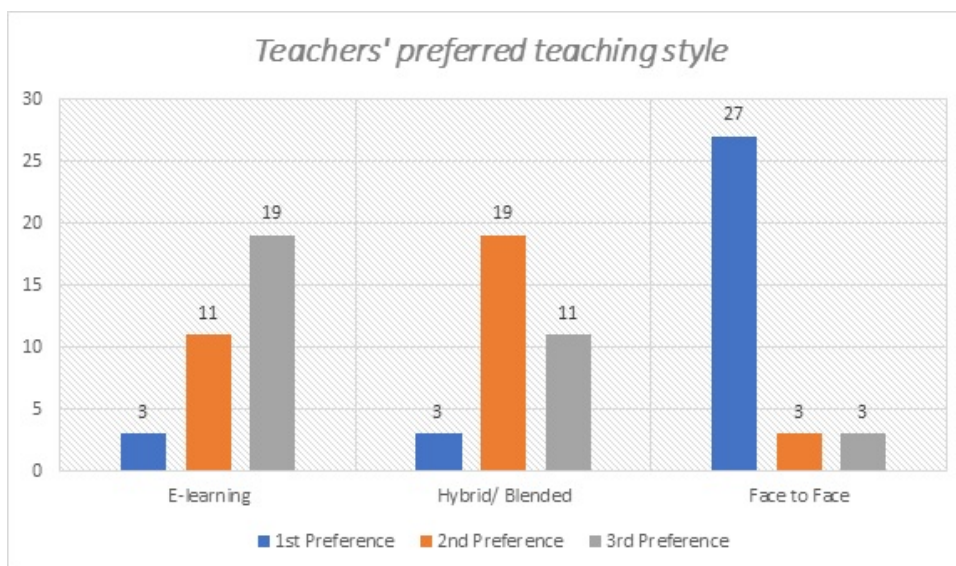
Figure 3: Teachers' preferred teaching style

Teachers' perception of their E-learning Readiness

Factors	N	Mean	St. Deviation
Technology	33	3.72	1.69
Innovation	33	4.42	1.09
Personnel	33	3.58	1.37
Overall		**3.96**	**1.41**

Table 3: Teachers' Perception of E-learning Readiness

To summarize, Table 3 displays the mean teacher response and the mean score for items associated with each component. As can be seen in the table, the overall mean score is higher than the degree of readiness that was predicted.

$M_o = 3.96 > M_E = 3.41$

By examining the aggregate mean score of teachers' responses, we may deduce that teachers are prepared for E-learning. However, they might need some improvement. The mean score for each factor might help identify gaps and highlight areas for improvement. Each factor has a mean score that is greater than the expected degree of readiness. In terms of human resources (personnel) and technology, teachers perceive themselves to be prepared for E-learning but could use some improvement. However, in terms of innovation, mean scores are quite high, indicating that teachers perceive their level of adapting to innovation to be quite strong and are prepared to move forward.

$M_{Tech} = 3.72 > M_E = 3.41$
$M_{Inno} = 4.42 > M_E = 3.41$
$M_{Personnel} = 3.58 > M_E = 3.41$

1.   Readiness in E-learning- Technology

Indicators	Mean	Standard Deviation	Interpretation
Resources			
Schools provide access to the Internet at school	4.39	1.46	**Ready** **Go Ahead**
Schools provide access to the Internet at Home	1.61	1.46	Not ready Needs a lot of work
Schools provide access to the Computer for Teachers at School	4.15	1.66	Ready Needs few improvements
Schools provide access to the Computer for Teachers at Home	2.58	1.98	Not ready Needs a lot of work

Have an uninterrupted Internet connection at your school	3.61	1.46	Ready Needs few improvements
Availability of Software (Microsoft Teams, Skype, Google Meet, etc)	4.94	0.35	**Ready** **Go Ahead**
Skills			
Used Computer/ Laptop teaching before?	4.39	1.46	**Ready** **Go Ahead**
Able to use mobile technologies to connect to the Internet	4.88	0.70	**Ready** **Go Ahead**
Can create instructional videos, quizzes, online assignments, tests, etc	4.06	1.32	Ready Needs few improvements
Use communications tools like Zoom, Microsoft teams, and Google Meet to take the classes	4.94	0.35	**Ready** **Go Ahead**
Use Microsoft tools like Word & PowerPoint to create study material	4.94	0.35	**Ready** **Go Ahead**
Can easily access & manage the assignment, discussion forum, assessment, etc online	4.64	0.93	**Ready** **Go Ahead**
Attitude			
E-learning enhances the quality, effectiveness, and productivity of Learning and Teaching	3.21	1.32	Not Ready Needs some work
Hybrid-blended model of education can be effectively implemented at your school	4.21	1.32	**Ready** **Go Ahead**
Total	**4.04**	**1.56**	

Table 4: Readiness in E-learning- Technology

Technological advancements ensure that e-learning stays relevant and valuable, say Bates and Sangra (2011). It is possible to deliver adaptive, learner-centered education with the use of technology in pedagogy today. For this, teachers must possess the prerequisite skills for integrating technology into their instruction.

Teachers' perceptions of their technological readiness indicate that they are highly prepared, with hardware, software, and an active Internet connection available at the school. However, because many teachers were taking online sessions from their homes, it was critical to check their home accessibility. Teachers reported that there was no hardware, software, or Internet access at the house provided by the school. Teachers believe they are prepared and equipped with all digital abilities except for making instructional videos, quizzes, and online assignments, which require some practice and guidance. Their attitude toward adopting E-learning in their schools is positive, but they are concerned about the quality and efficacy of E-learning in the classroom *(Refer Table 4)*.

Additionally, teachers gave the following arguments in favor of the assumption that E-learning or a hybrid/blended model may be implemented effectively in their school:
- The school is equipped with the necessary resources to adopt the E-learning or hybrid/blended model.
- The E-learning and hybrid approaches adopted during the COVID-19 epidemic instilled confidence that they can be replicated in the future with appropriate leadership.
- They now have around 1.5 years of practical experience.
- Schools have adequate infrastructure and a smart classroom setup to enable optimal implementation.

Some teachers expressed uncertainty regarding its implementation and cited barriers to E-learning or blended learning, such as
- Lack of time for developing e-learning content;

- Heavy workload;
- Lack of proper training;
- Inadequate resources (hardware and software); and
- Limited technical support

It is not explicitly stated, but rather implicitly expressed as part of curriculum changes when demands are made for teachers to improve their performance when using technology in the classroom. This shift manifests as a desire to master new abilities, which teachers frequently perceive as an additional responsibility (Alvarez *et al.*, 2009).

Moreover, they mentioned the following reasons for their concern:
- Traditional face-to-face teaching is more effective.
- Disrupted internet accessibility at schools.
- Anything new takes time to grasp.
- The E-learning/ Hybrid approach may not be the ideal option for young children.
- It's difficult to determine which students are struggling to understand during online sessions, and students are sometimes hesitant to ask.
-

2. *Readiness in E-learning- Innovation*

Indicators	Mean	Standard Deviation	Interpretation
Resources			
Schools provide the Guideline to follow for E-learning teaching	4.39	1.46	**Ready** **Go ahead**
Schools provide the Guideline to follow for Hybrid/ Blended teaching	3.91	1.81	Ready But needs a few improvements
Schools provide the Guideline to follow for Face to face teaching	4.64	1.17	**Ready** **Go ahead**
People avoid utilizing technology because they are afraid of making a mistake.	1.91	0.98	Not Ready Needs a lot of work
Skills			
Guide and maintain online interactive discussions with students and fellow teachers	4.64	0.93	**Ready** **Go ahead**
Design and organize online content and activities for the students	4.64	0.78	**Ready** **Go ahead**
Use Peer assessment, and virtual field trips as a technique	4.39	0.93	**Ready** **Go ahead**
Have used technology (like quizzes, Kahoot, Quizlet, jamboards, etc) to support learning	4.09	1.33	Ready But needs a few Improvement
Integrate a variety of web-based tools and resources to support learning	4.21	0.99	**Ready** **Go ahead**
Attitude			
Teachers need to be flexible in dealing with student's needs (e.g. absence from class, re-exams, etc)	3.48	1.23	Ready But needs a few Improvement
Feel the need to change your Teaching strategies. (e.g. collaborative teaching style, flip classes, storifying and gamifying it, etc)	3.52	1.23	Ready But needs a few Improvement
Teachers need to rethink and redesign teaching materials to fit the needs of the E-learning/ blended learning	3.82	1.31	Ready But needs a few Improvement
Computers, laptops, and mobiles are easy to use for teaching and Learning	3.70	1.33	Ready But needs a few Improvement
Monitors student's adherence to Plagiarism (stealing, copying work) policy	4.15	1.33	**Ready** **Go Ahead**

An interactive learning environment is crucial for students (e.g. relating with real-life examples, group work, peer assessments, etc)	3.67	1.36	Ready But needs a few Improvement
Social Media Platforms like Facebook, Instagram, and Twitter can be used as a medium for teaching & learning	2.48	1.20	Not Ready Needs a lot of work
Total	**3.85**	**1.42**	

Table 5: Readiness in E-learning- Innovation

According to the resources under Innovation in E-Learning, schools have provided teachers with guidelines for implementing e-learning and face-to-face learning, but have not included guidelines for implementing hybrid/blended learning or clear guidelines for transitioning between different modes of teaching. Additionally, it is stated that teachers need to adapt their teaching methods to incorporate technology, but many are unwilling to do so out of fear of making a mistake. They were generally prepared to advance with their innovative abilities, but they needed to improve their integration of technology into education. Teachers say they must have a more positive attitude toward innovation. Several innovative methods may be utilized to make teaching more engaging, entertaining, and pleasurable *(Refer Table 5)*. Children spend the majority of their time on social media, yet there are few examples of using social media to teach in schools.

Openness to Innovation:
While sharing unique strategies used by themselves or their school that they believe have had a positive impact, teachers mentioned the following strategies:
- Using Nearpod in classes
- Making creative and interesting content with the help of videos
- Involving Parents - after-school Parents-students activities
- Use of apps like Kahoot, quizzes, and Microsoft whiteboard
- Online summer camps
- Short-duration classes with activity-based content
- A live worksheet, auto-check grand test, pre-recorded video and audio lessons, online workshop, and a virtual teams meet-up session
- Gamified learning

3.   *Readiness in E-learning- Personnel*

Indicators	Mean	Standard Deviation	Interpretation
Resources			
School provides access to the Online helpdesk support in resolving and assisting you if you come across a difficulty during online teaching	4.27	1.57	**Ready** **Go ahead**
An online helpdesk is available at school to support interruption-free teaching	3.73	1.15	Ready But needs a few Improvement
Standard guidelines across schools for implementing Hybrid- Blended Education	3.91	1.28	Ready But needs a few Improvement
Standard Guidelines from experts help in maintaining the quality of education	4.00	1.25	Ready But needs a few Improvement
Skills			
Are adequately prepared to teach online	3.45	1.25	Ready But needs a few Improvement
Teachers need to participate in professional development programs in learning new teaching or technical skills to keep them updated.	3.88	1.32	Ready But needs a few Improvement
Provide prompt, helpful constructive online feedback to the students on their assignments & exams	4.70	0.73	**Ready** **Go Ahead**
Total	**3.99**	**1.28**	

Table 6: Readiness in E-learning- Personnel

The majority of respondents in the survey are highly educated; they are postgraduates who have also completed teacher training courses. Additionally, the school has provided them with an online helpdesk to assist them if they encounter difficulties, but it still requires a few improvements. They also require some improvement in terms of skills, training, short courses, etc., that may be beneficial in enhancing their abilities *(Refer Table 6)*.

 Ability to learn with Technology:
When asked about rating their experience with technology (i.e. animation, podcasts, discussion forums, and streaming videos), 84.8 % (28) stated that they have significant experience with presentation and email, 72.7 % (24) stated that they have high experience with streaming videos, and 45.5 % (15) stated that they have high experience with discussion forums, whereas 57.6 % (19) state that they have no experience with podcasts and 36.4 % (12) state that they have no experience with blogs *(Refer Table 7)*. According to Redmond *et al*. (2018), an essential skill of online education is facilitating student communication via discussion forums, emails, and chat rooms (Redmond *et al*., 2018). Freedman (2003) has devised strategies for teachers to utilize in online classrooms to improve student-teacher communication (Freedman, 2003). So it's vital to understand how teachers communicate with technology.

	No Experience	Average Experience	High Experience	Total
Animation	7 (21.2%)	18 (54.5%)	8 (24.2%)	33
Podcast	19 (57.6%)	11 (33.3%)	3 (9.1%)	33
Blog	12 (36.4 %)	19 (57.6 %)	2 (6.1%)	33
Email	1 (3%)	4 (12.1%)	28 (84.8%)	33
Discussion Forum	4 (12.1 %)	14 (42.4%)	15 (45.5%)	33
Streaming Videos	0	9 (27.3 %)	24 (72.7 %)	33
Presentation	1 (3%)	4 (12.1%)	28 (84.8%)	33
Calendar	1 (3%)	18 (54.5%)	14 (42.4 %)	**33**

 Table 7: Experience with technology

4.   E-learning Training
In the previous two years, 22 instructors out of 33 had attended E-learning workshops, and 21 of them considered it quite valuable *(Refer Table 8)*.

Training/workshops attended in 2 years (2020-2022)	Counts
1-2	8
3-5	5
6-9	4
10 and more	5
Total	**22**

Table 8: Number of Training attended by teachers in 2 years

Teachers who have not received training in the past feel the need to attend such training in the future. They cited the following reasons for their absence:

- *It was never arranged by the school.*
- *I applied for the training but was not selected to attend.*
- *The training was paid and expensive.*

Additionally, teachers claimed that E-learning is just as rigorous as classroom teaching and that time management is critical for a teacher. When asked whether they can post online content or material on time, 28 said that they usually do, while 5 answered that they occasionally miss deadlines but make an effort to stay on time. Online instructors' experiences indicate that, compared to regular classroom instruction, online instruction requires more time (Martin *et al*., 2019). A lack of time for preparation and delivery has been identified as a major obstacle to online teaching, indicating that more time and better scheduling are necessary for E-learning instruction (Baran *et al*., 2013). Teachers are required to create better time-management skills as they adapt to E-learning (Min Shi, Curtis J. Bonk, 2006).

Construct	N	Mean	Standard Deviation	Interpretation
Resource	33	3.72	1.69	Ready but needs a few improvements
Skills	33	4.42	1.09	**Ready Go Ahead**
Attitude	33	3.58	1.37	Ready but needs a few improvements

Table 9: Statistics for resources, skills, and attitudes

The mean score for teachers' responses to the resources, abilities, and attitude items is shown in *Table 9*. In other words, teachers think they are ready for E-learning in terms of skills, but need to improve resources and attitudes. Apart from this, two additional questions were posed to teachers on their experience and views of educational opportunities. The following were the most significant responses:

What was your initial response upon learning that you will be required to teach classes online?

Many teachers were apprehensive and perplexed by its implementation since they never imagined online classrooms would be viable, yet a few were excited and surprised. They stated the following:

- *I was not happy when I came to know that I had to take online classes. There is no way that online learning can ever fully replace the impact and promise of face-to-face interactions between students and teachers. I feel like I've lost the ability to connect with my students because of my new role.*
- *Initially, I was a little nervous but gradually adapted to the change.*
- *Surprised but the transition to online had already begun with many online webinars taking place every month in school for students and teachers.*
- *As I was dealing with tender age children there were a lot of apprehensions and uncertainties.*
- *I was kind of mentally prepared for this to happen.*
- *Apprehensive, Worried that it would not be as beneficial*

What do you think the future of school education in your country will be like?

- *School education needs to be in person, as you can build connections more easily with the kids. But we can keep integrating online components that we have learned during the pandemic.*
- *Growing tremendously with new experimental techniques and methods to teach. Teachers and students both have creative freedom, especially in the private sector, but you can't say the same for the government schools. There's a long way to go until we reach the point of providing education for all in an online format.*
- *As of now, I feel that right across the world, students have gotten used to this system and will be looking forward to blended mode, even though face-to-face is the ideal way to create a good relationship between an educator and a student. Nevertheless just within a week whole mode/system of education could be changed, therefore is possible that the new generation would get used to this system and things would all seem as easy as lemon squeezy for them.*
- *With online teaching, I think we have added one more innovative way to the learning process, and the blend of all will definitely make the education system flexible and impactful.*
- *I see that we have an important role to play in society, even though a lot of material is available on the internet, but without a trainer, it is very hard to understand, and a teacher, a school, classrooms, and a whole setup do not*

only provide students with education related to various subjects but also give us the environment, which is very important for our well-being as well. I believe a blended way of learning and teaching is an addition but would never replace face-to-face teaching. It is definitely an asset and very useful for working people of different age groups, for someone who wants to change careers, etc. We as teachers need to learn and set the right balance, or the right percentage amount of content, in our teachings. The future of teachers will change more toward a trainer or a facilitator who will be guiding students' content created by giant educational material creators.

- *Hybrid learning has a constructive future ahead.*
- *Teachers and students learned new techniques, so the standard of education will improve in the future.*
- *Technology is becoming a major part of education. I can see it as very challenging for both teachers and students.*
- *A more collaborative, innovative, and engaging environment that will be able to connect to students in or out of the classroom.*
-

CONCLUSION & RECOMMENDATION

The pandemic forces a reshaping of the Indian educational system. Within a few months of the pandemic, the whole educational system was prepared to transit from the classroom to E-learning. This pandemic has provided teachers with an opportunity to use technology in their classroom instruction. While implementing a new technique for teaching and learning, teachers must overcome several obstacles. For some teachers, providing online classes was a major challenge, as they have been accustomed to delivering classroom instruction for many years. The crisis was having a direct effect on our educational system. Teachers assist their students with academic pursuits by utilizing technology-based teaching. As a result, a slew of complications arose. It was critical to identify those obstacles and make practical efforts to overcome them in order to attain the educational process's objectives.

Each stakeholder in the educational process must collaborate to accomplish their objectives. Thus, we would be able to ensure a better future for succeeding generations. Teachers' attitudes towards the value of innovative online teaching skills and their ability to implement them have a significant impact on the achievement of effective teaching goals. The findings of this study will have an effect on teachers, students, and the entire institution.

The study's findings may serve as a reflection for the institution in terms of considering how to sustainably integrate E-learning into schools and understanding the needs of teachers. However, E-learning should complement rather than replace conventional education. This is because human civilization is fundamentally social, and thus face-to-face interactions will be critical and essential.

The educational institution's administration should compel teachers to receive proper training on learning software that enables them to educate and assist students effectively and efficiently. A quality assurance board can be created to oversee E-learning constantly, and it is advised that schools develop explicit rules (Marshall et al., 2020).

LIMITATIONS AND FUTURE RESEARCH

There are certain limitations to consider when interpreting the findings of this study. Although the study began with a comprehensive review of the available literature on the subject, the researchers do not claim that it is comprehensive, as further research in this field is possible. Additionally, this study is confined to assessing teachers' readiness for online teaching by self-evaluation, which may not adequately reflect the teachers' genuine capability level. Therefore, this may be evaluated further from the students', parents', and leadership's viewpoints.

The sample for this study was comprised of teachers who worked in private schools. The findings of this study may not be generalizable outside of this group. Since this study was a pilot to assess the need for doctoral research on this topic, the sample size was delimited. Future research might incorporate other parameters pertaining to online teaching and learning. These results, despite their flaws, demonstrate how critical it is to assist teachers in the increasingly common practice of E-learning. This study highlights teachers' perceptions of their skills and capabilities in E-learning and gives guidance to improve their capacity to establish long-term education system resilience.

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EXAMINATION OF THE RELATIONSHIP OF THE EXPANDATION OF DISTANCE EDUCATION IN THE GLOBALIZATION PERIOD AND THE MARKETING OF EDUCATION

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ABSTRACT
The effects of the competition created by the spread of distance education in the world are of great importance in the education market. As a result of globalization, distance education gains great importance and education is one of the sectors with the largest market in our age. Students from all nationalities in the world can obtain a certificate or diploma without obtaining a visa. With this study, it is tried to reveal the situation of the "distance education" process in the international market in developed and developing countries. Researches on the economic size of the international education market, the most preferred countries, universities, departments and student profiles who prefer distance education have been compiled and brought together.
#distanceeducation #neoliberalpolicy #globalization

1. INTRODUCTION

1.1. Problem Status

Neoliberal approaches, which emerged as an inevitable result of capitalism, brought many changes in education. Today, it is not possible to avoid the effects of globalization, which we encounter in almost every aspect of our lives. It is witnessed that the education sector, which is one of the most important wheels of the system we live in, has to compete due to capitalist interests. In developed countries that support neoliberal policies that enable private initiatives, international and high-cost studies related to the distance education process continue rapidly. Although the education sector is defined under the name of public service in many countries and Turkey for about 25-30 years, it has become one of the private investments.

Bourdieu's statement that "neoliberalism implies all collective structures that would impede pure market logic" is an indication of how important this situation is. With the inclusion of marketization in all sectors, commodification in education and students-parents began to be viewed as customers simultaneously. Thanks to the innovations in technology, it is known that wherever you are in the world, you can get a certificate or diploma by applying to many platforms related to the field you want to study. There are millions of people who can study at a language school in a different continent without leaving their city or even their home, and receive their diplomas by taking courses and passing online exams in the programs they have settled in with certain criteria.

Of course, considering the fact that a certain payment is made, it is not difficult to guess that schools, companies and institutions are in great competition. In the light of developments in education, this study will be discussed from a critical perspective in the direction of statistical data in order to reveal the spread of distance education and the strategies underlying it.

1.2. Purpose of the research

With the spread of distance education in the world, it is aimed to reveal the reflections of the competition in education in the education market.

1.3. Problem Statement and Sub-Problems

What is the economic size of the international distance education market?
Which countries benefit most from international distance education?
Which are the most preferred countries, universities and programs in international distance education programs?

1.4. Importance of Research

With globalization, distance education has gained great importance all over the world and has made education one of the sectors with the largest market today. Students from all nationalities in different continents have the right to obtain a certificate or diploma without the need for a visa. The "distance education" process, which is carried out in the international arena out of the national dimension, is aimed to reveal the situations in developed and developing countries. Studies on the economic size of the international education market, the most preferred countries, universities, departments and student profiles who prefer distance education will be examined in accordance with statistical data.

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2.Source Research

2.1. Neoliberalism and Education

Marx emphasized centuries ago with the words that "for the formation of a suitable education system, a suitable education system is necessary for the change of social conditions and at the same time for the change of social conditions" (cited in Cole, 2008). Today, it is known that while witnessing the marketization of neoliberal policies and education that capitalism benefits from, efforts are made to stand against it at the same time. Marketization forms the basis of neoliberal policies in education. The marketization of education is the withdrawal of the state from the economy of education and the increase in the earning area of private institutions by increasing, on the other hand, the direct adaptation of educational goals to market goals and needs (Sayılan, 2014: 53-55).

Neoliberalism has developed from the 70s to the present despite many crises and has achieved its present supremacy. In the efforts to regain the rights taken from the workers by social, economic, cultural and political resistances, military coups have occurred in countries such as Turkey, Argentina and Chile, but they have been supported for a long time in the democratic context in capitalist countries such as the USA and England (Harvey, 2005). According to Thompson (2007), neoliberalism differs from liberalism with its interventions in education. In classical liberalism, individuals independently defend their interests and provide the mobility of the social order with their actions.

Neoliberalism's view of education, on the other hand, is market-oriented and conservative, and the education system needs economic conditions. Neoliberal market strategies are needed to eliminate educational problems. Distance education, which causes the marketization of education, occupies a very important area. Activities carried out within the scope of distance education cause economic competition by intensifying the education market.

2.2. Distance Learning

Thanks to the changing and developing educational technologies, there are no space and time limitations in education, and distance education, which was previously provided by letter, is spreading rapidly throughout the world today (Kınık, 2014). With the globalization of communication technologies, education systems are also becoming global and new educational strategies are emerging thanks to groundbreaking developments in information systems. With distance education, teachers and students, who are kilometers apart, can teach with audio and video. This situation is a very important value for social development both in the international arena and in Turkey (İşman, 2011).

Undoubtedly, the reason for the emergence of distance education is not only the current professional development of individuals, but the majority of those who benefit from distance education who need to improve themselves while working or who are trying to gain a different qualification (Gökçe, 2008). Alkan (1996) states that with distance education, it is possible to have new options, to integrate education and business life, to personalize and democratize education, to ensure lifelong and effective learning, to integrate technology with education, to reach a large number of people, to balance educational demands and financial opportunities. .

Distance education is carried out in four ways: synchronous, asynchronous, and individual education at the computer. Synchronous lessons are realized by the simultaneous presence of the instructor and students in the online classroom environment, thanks to the live connection. Asynchronous courses, on the other hand, can be done on the internet. The student has the opportunity to watch and listen to the lessons many times over the internet

from wherever he wants. In individual education programs, students listen to the lesson whenever they want within the program and package they receive. In blended learning, it is aimed to realize learning by doing distance education and formal education together. In addition to using the classroom environment, some courses are held online (Demiray & İşman, 2001).

Hyatt (1998) states that the fact that teachers and students are not in the same place do not qualify as distance education by many participants, only that there is no physical integrity and that education is carried out online thanks to technology.

2.3. Distance Education and Its Features

The most prominent features of distance education are personalization, privatization, industrialization, serving those who do not comply with traditional education, mobilization, fast feedback, economy and technology. Preparing course content according to individual characteristics based on the uniqueness of each student is personalization. Privatization, on the other hand, is the ability of students who are separated from the classroom environment to perform individual learning by leaving institutional learning. Despite the rapidly growing demand, the opening of effective distance education institutions is conducive to its industrialization.

Employees, people living in different cities or countries, as well as sick, disabled, prisoners, etc. It is not possible for the people in the groups to receive education opportunities with traditional methods. They can get the opportunity through distance education. In line with wireless communication possibilities, independence from space is possible. Mobilization is one of the most beneficial features of distance education. Thanks to the quick feedback, the student can easily receive evaluations about their homework from the trainer via e-mails, and exams etc. The results are shared on the internet.

When evaluated financially, it is known that it is much more economical than formal education and it is possible to participate from all over the world thanks to satellite. With the development of technology, education becomes much more easily accessible, and gaining significant advantages through temporal and spatial savings is one of the opportunities that the digital world offers to people.

2.4. Pioneers of Distance Education in the World

It is stated that the first distance education in the world was carried out in Sweden in 1728 by letter. However, due to the lack of information on the details of this education, the shorthand lessons made by letter in Bath in 1833 are accepted for the first time in the literature. It is stated by Isaac Pitman, a shorthand specialist, that he teaches how to write parts of the Bible in shorthand, evaluates students and gives points (Durdu et al., 2016).

Distance education, which started in England, France, the United States and Germany in the middle of the 19th century, quickly became widespread. Distance education, which started to be carried out within the universities of Cambridge (1840), Illinois (1870), New York (1883), gained an advanced dimension with the establishment of International Letter Learning Schools in 1890, and by enacting a law in 1915, the National Higher Education Association in the state of Winsconsin in the United States. NUCEA was established (Hall, 2006). In our country, with the first initiative dating back to 1974, distance education started with the establishment of the "Open Education Faculty" within Anadolu University with the law that came into force in 1981. Internet-based applications were realized in 1996 under the leadership of Middle East and Technical University Informatics Institute (Yalabık, 2001).

Today, Illinois, California, Pennsylvania, Stanford, Utah universities are the leading universities that provide distance education. The University of Utah has been training private education teachers over the distance education system for more than 35 years (Jamescon & McDonnell, 2007).

2.5. International Education Market

Yang and Vidovich (2002) argue that globalization is characterized as a combination of differences, a complex combination of bipolar oppositions by adding them together, and that its real effect will be formed by the reactions of individuals. Since the international student market in education is very large, universities consider the income to be obtained when making financial arrangements. When considered globally, distance education in higher education is evaluated within the scope of international education (McBurnie, 2002).

As a result of globalization, universities have to make many arrangements and find financial resources and support in order to realize international education. Countries such as the United States, England, Canada and Germany, which have the largest share of the cake economically, are quite large It emphasizes that it is an inevitable fact that it has a participatory audience (Askeland & Payne, 2007).

Karpenko (2008) claims that the demand for distance education, which started in Russia in the late 90s, has recently been seen as an alternative to formal education. The distance education institution, which started in Russia, has more than 350 centers throughout the country and 60 centers in other countries. Distance education in the country is defined as the technology that provides quality education. It is stated that the distance between the center and the countryside has disappeared, and many economic and social problems have disappeared. The majority of the country, in support of Ivan Illich's "unschooled society" ideal, obtains the right to graduate with the courses they attend from their homes and workplaces and the exams they take, without going to school.

This is in a way an indication that Drucker's idea that university campuses will disappear in the next 30 years is not far off.

2.6. Preferred Countries, Universities and Departments in Distance Education

Management and economics are at the forefront of international distance education programs and departments. Management and economics are at the forefront of international distance education programs and departments. The reason for this is that it demands training related to the field of business and administration, especially in developing countries. There are the highest number of teaching and economics graduates in distance education worldwide. The least preferred departments are those related to agriculture and medicine.

Independent universities providing distance education carry out every activity related to the preparation phase and operation of their programs within their own structure. Athahesco University in Canada, National University of Distance Education in Costa Rica, British Open University are independent universities managed from the centre. Regionally-governed independent universities, on the other hand, provide distance education programs entirely by the institution, but technological infrastructure, student counseling service, etc. units are managed from the center to which they are affiliated in the region. The University of Television of China in the People's Republic of China and the National Distance University in Spain provide education according to this model.

In universities with a combined structure; Institutions providing distance education operate in cooperation with universities providing formal education. Tele University in Canada provides education according to this model. In addition to training within the University of Quebec board of directors, Tele University has online undergraduate and graduate programs. Distance education systems in schools in Germany are supervised by the central office in Dresden. The central office is responsible for the selection and placement of students in the programs, curriculum preparation studies, procurement of materials and equipment, student guidance services and administration. The distance education department at the University of Queensland in Australia has a dedicated online department within traditional university planning and is responsible for running online courses and managing programmes. Another university in Australia has a similar structure in New England, the only difference being that it consists of many departments. The university lecturers here provide consultancy to those who receive education from outside, other than their own students. The distance education management system is not involved in academic duties, but only deals with administrative affairs.

Massey University in New Zealand is the most preferred among universities with a complex structure consisting of multiple institutions. Officially, there is a system in which a large number of students, both students and non-students, take the exams and their results are valid in other and their own schools (Keen & Rumble, 1982).

2.7. Student Profiles Preferring Distance Education

Although the students are generally between the ages of 20 and 40, there is a wide age distribution. There are different distance education programs attended by younger age groups and older people. Most of them are individuals working in a part-time job. The number of boys is higher than that of girls. Persons with disabilities, convicts or those with limited means of transportation in disadvantaged groups constitute the smallest slice of the pie.

It is stated that the students who receive distance education generally have high motivation, they want to receive education in line with their decisions and desires, they are individuals who aim to live themselves in better conditions financially and morally by continuing their work and education lives together and then starting to work in much better conditions.

It is stated that the students generally have moderate economic opportunities and their levels are quite different from each other. Different individuals with past student experiences must meet certain criteria in order to be included in programs or departments. (Act. Ozer, 1999).

3. Discussion and Conclusion

Thanks to distance education, millions of students can have the chance to receive education wherever they are by saving time and space. Distance education is of great importance especially for disadvantaged groups in terms of self-development, language learning and advancement, diploma and certificate, since it reduces the cost of students by eliminating the necessity of being in the school environment.

The fact that it provides the opportunity to continue lifelong and also gives the opportunity to continue with working life has caused individuals to turn to distance education more in recent years. Due to its features such as creating new options, combining work and education life, lifelong learning, effective benefit from education systems and platforms, digitalized education strategies, reaching a large mass of people, and being more economical than abroad, more and more people around the world start distance education every day. starts (Alkan, 1996).

In addition to its numerous advantages, of course, it is inevitable that it will have some negative features. It prevents individuals from socializing, those who do not have the ability to self-control and self-evaluation experience difficulties, they prevent the acquisition of some behavioral qualities, they are insufficient in the lessons and subjects that need practice, they are dependent and dependent on the digital environment and materials and therefore the virtual environment, students cannot be given timely feedback, peer He is exposed to many criticisms because of his isolation from human relations due to the inability to be in a friendly environment and because of those who put someone else in the exam (Oral, 2014).

Thanks to the Internet, millions of students have the chance to graduate from the world's leading universities. With globalization, individuals who do not have high financial means can benefit from the institution located at the other end of the world without any expense to go to a different country. However, middle- and high-income individuals can benefit from this situation, because when the low-income group's tuition fees, internet access and technological devices are taken into account, the inequality of opportunity in education becomes even more.

Considering the fact that distance education universities in countries such as England, Germany, Canada, and the United States have very high fees, there are increasing criticisms that the gap between those with low economic status and those with high economic status will increase.

As a very concrete example of the commodification and marketization of education, prestigious universities hold various campaigns, promotions and scholarship exams, and carry out various straegies to continue to benefit from their share of the pie.

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M-LEARNING COMPETENCY AND ADEQUACY OF HIGHER EDUCATION STUDENTS TO ADOPT MOBILE LEARNING APPROACHES

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ABSTRACT

Nowadays, mobile technologies have become more widely used in various industries, including accounting, business, travel, entertainment, sport, marketing etc. As a result of these advancements, mobile technologies are now being used for educational reasons. This study aimed to examine the M-Learning competency and Adequacy of higher education students to adopt mobile learning approaches. The research data for the analysis came from a sample of 150 students from Dayalbagh Educational Institute. The study concluded that students have enough potential to adopt mobile learning approach. Engineering Students were found to be more competent in adopting mobile learning approaches.
Keywords: Mobile Learning, Competency, Adequacy, Mobile Learning Approaches

INTRODUCTION

Developments in digital technology have created many new possibilities for educational delivery. Mobile technologies provide flexibility in learning; it includes anytime-anywhere digital resources which extend the reach of learning beyond the classroom walls. Because of the flexibility of mobile technology, the notion of mobile learning (or m-learning) has emerged (Sharples, 2000). It allows us to access and apply learning information regardless of time, geography, or location. Mobile Devices such as laptops, personal computers (PCs) and smartphones are now widely used for interrogation, data recovery, and data acquisition. Cell phones and their features (such as accessing the Internet or exchanging information) are increasingly used for educational reasons. The turn of events and evaluation of instructional settings for appropriate learning workouts inside and outside the study hall is being aided by portable innovations. Recently it has become so common to see people using smartphones, tablet or computers to access the information fron the internet, playing games, listen to music, or to watch movies at any time; this is equally true in official and informal teaching-learning situations.

Mobile devices are especially useful for storing data or accessing information from course materials, e-books, and other sources (Sarrab, 2015). In addition to consuming material, mobile devices and applications allow users to search, find, and even create it. As a result, these technologies are altering how we access and utilize information, as well as how we learn. The importance of mobile learning in students' academic lives is growing, and a thorough examination of stakeholders' attitudes and perceptions (instructors, learners, and institutions) reveals useful suggestions for the design, development, and management of mobile technology integration into teaching and learning environments as a powerful means of achieving the goals. Mobile devices may be utilized for various learning activities, allowing students to connect different forms of learning. For instance:
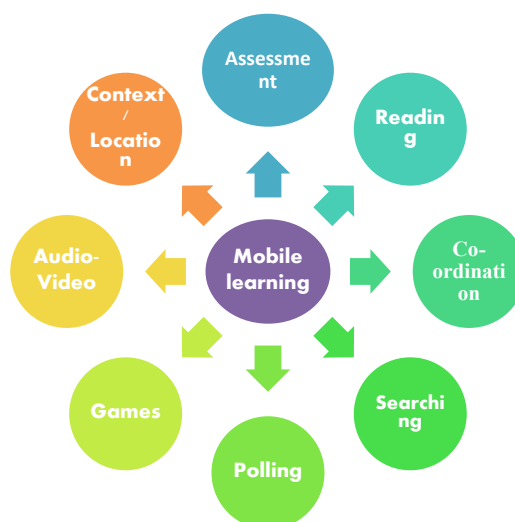
Fig 1: Mobile Devices as a Means for Learning

OBJECTIVES OF THE STUDY

The research aims to accomplish the following objectives:

1. Study of M-learning Competency of Different Streams to adopt Mobile Learning Approaches at Higher Education Level.
2. Comparison of M-learning Competency of Different Streams to adopt Mobile Learning Approaches at Higher Education Level.
3. Study of M-learning Adequacy of Different Streams to adopt Mobile Learning Approaches at Higher Education Level.
4. Comparison of M-learning Adequacy of Different Streams to adopt Mobile Learning Approaches at Higher Education Level.

METHODOLOGY

This study employed a descriptive survey approach. The sample for the paper included 150 undergraduate students from various faculties of Dayalbagh Educational Institute in Agra. The selection of students was made with the Purposive Incidental Sampling Method. The researcher has created two 5-point rating measures to assess and compare undergraduate students' M-learning Competency and M-learning Adequacy of higher education students. The data were analyzed through the following statistical techniques: means, standard deviations t-test, and Kruskal-Wallis test. The information gathered was examined quantitatively and subjectively. Following the scoring technique,'t'-values were used to determine the significance of differences between the study's variables. Kruskal-Wallis Test was applied to determine the association between distinct variables.

RESULTS AND DISCUSSION

To fulfil the objectives of the study and to test the hypotheses, the researcher has applied various statistical techniques to the collected data. In order to validate the objectives and to test the null hypotheses, the current research has been assessed as follows:

Study of M-Learning Competency of Different Streams to Adopt Mobile Learning Approaches at Higher Education Level

To Compare the M-learning Competency of Students of different Streams to see whether they are ready to adopt mobile learning approaches at the higher education level, some descriptive and inferential statistics are used:

Table 1: Descriptive Statistics for comparison of scores of students of different streams

	Arts	Commerce	Education	Engineering	Science	Social Sc.
Mean	110.85	114.59	112.64	124.40	120.68	116.84
S.D	14.49	20.42	13.28	11.14	18.86	17.21

Table 1: Mean and Standard Deviation of Students of Different Streams

A graphical representation of the Mean and Standard Deviation of students of different streams is shown in the following figure:
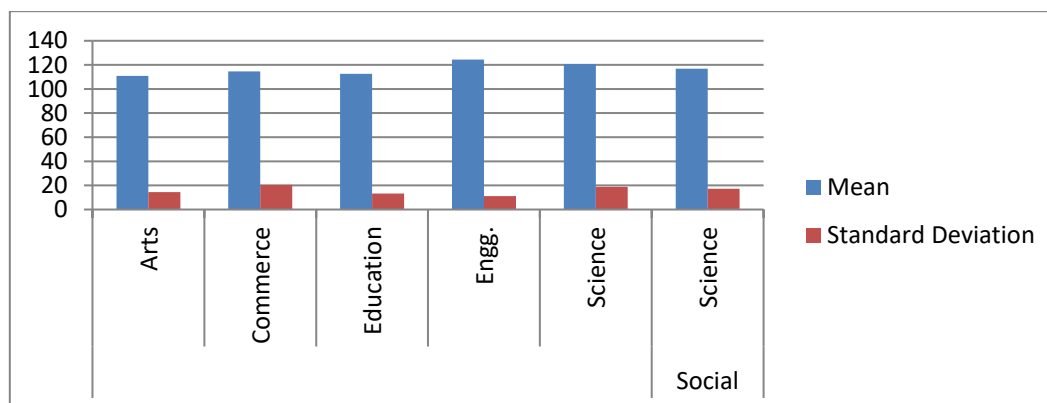
Graph 1: Graphical Representation of Comparison of the M-Learning Competency of Students of Different Streams

Scores of Students in the Engineering and Science Streams are found to be higher than that of the other four streams. The mean scores of Engineering Students are 124.40, whereas the Standard Deviation of scores of Engineering Students is 11.14, which is the lowest of the Standard Deviation of scores of students of other streams. Having the greatest mean and lowest standard deviation clearly indicates that engineering students are more competent to adopt mobile learning at the higher education level. These findings indicate that the students of different streams differ regarding their M-Learning Competency for adopting mobile learning at the higher education level. But is this difference really significant? To find it out, Kruskal-Wallis Test was employed. The calculated K value was 18.696, which is greater than the table value with 4 degrees of freedom at 0.05 significance level. The findings suggest that the students of different streams don't possess the same degree of M-Learning Competency for the adoption of mobile learning approaches at the higher education level, which may be the result of a stream of study, individual differences, family environment and opportunities etc.

Study of M-Learning Adequacy of Different Streams to Adopt Mobile Learning Approaches at Higher Education Level

To Compare the M-learning Competency of Students of different Streams to see whether they are ready to adopt mobile learning approaches at the higher education level, some descriptive and inferential statistics are used:

Table 2: Descriptive Statistics for Comparison of Scores of Students of Different Streams

	Arts	Commerce	Education	Engineering	Science	Social Sc.
M	93.62	96.32	95.84	104.12	101.52	98.21
S.D	20.36	17.54	18.25	12.25	16.63	15.26

The perusal of the table indicates the mean and the standard deviations of the scores of different students. The distribution of their scores can be represented through the graph:
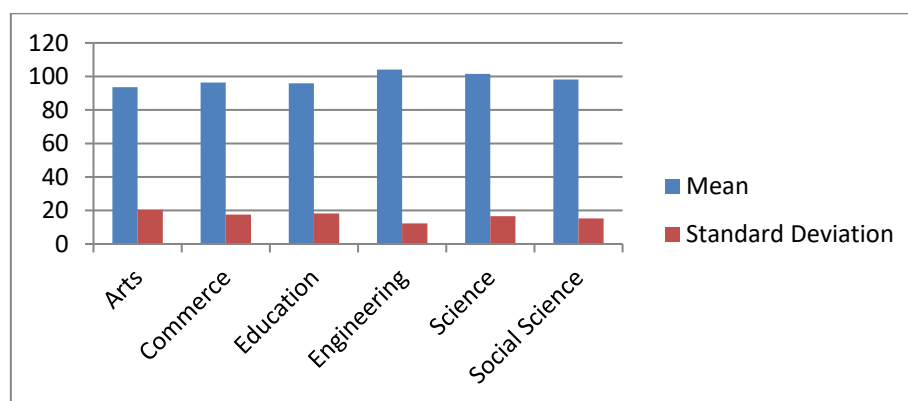
Graph 2: Graphical Representation of Comparison of the M-Learning Adequacy of Students of Different Streams

The mean scores of Engineering students are 104.12. In contrast, the Standard Deviation of scores of the Engineering students is 12.25, which is the lowest of the Standard Deviations of scores of students of other streams. Having the greatest Mean and lowest Standard Deviation clearly indicates that Engineering Faculty students are more competent to adopt Mobile Learning Approaches at Higher Education Level. These findings indicate that the students of different streams differ regarding their M-Learning Adequacy for the adoption of mobile learning at the higher education level. But is this difference really significant? To find it out, Kruskal-Wallis Test was employed. The calculated K value was 15.542, which is greater than the table value with 3 degrees of freedom at 0.05 significance level. The findings suggest that students of different streams don't possess the same degree of M-Learning Adequacy for the adoption of mobile learning approaches at the higher education level.

CONCLUSION

The findings of the present paper state that there exists a significant difference exists in the degree of M-Learning Competency of the students of different streams for the adoption of mobile learning approaches at the higher

education level. The findings of the present study also state that a significant difference exists in the degree of M-Learning Adequacy of the students of different streams for the adoption of mobile learning approaches at the higher education level. It was found that the students of different faculties do not possess the same degree of M-Learning Competency and Adequacy to Adopt Mobile Learning Approaches at the Higher Education Level. A significant difference is found among them regarding M-Learning Competency and Adequacy to adopt Mobile Learning Approaches, which may result from their streams of study, individual differences, family environment and opportunities etc. The Mean Scores of Engineering Faculty Students are found to be highest than that of other than the four streams relative to their M-Learning Competency and M- Learning Adequacy.

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NEW VOCATIONAL SCHOOL STUDENTS' VIEWS AND EXPECTATIONS CONCERNING ONLINE LEARNING AND STUDYING MATHEMATICS

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ABSTRACT
Learning mathematics online in vocational upper secondary education is a growing but little studied area. The main purpose of this research project is to develop an asynchronous online course in mathematics which would be suitable for a variety of vocational fields. This article concerns 824 Finnish students who were commencing their studies leading to a vocational upper secondary qualification in seven different fields and looks at their views on and expectations of the online learning and studying mathematics. The results, which draw on a questionnaire distributed to the students show that they regard online learning as a rather flexible way of studying and that the ability to contact a teacher through chat is considered important when studying in an online learning environment. Compared to some other fields, students of Technology are significantly less likely to think so. According to the results, mathematics is regarded as important for a future career, and it is obvious that students do not want to study mathematics more than their future careers require. The field of study influences significantly a student's experience of the need for support in studying mathematics. Students of Health and Welfare consider mathematics to be as the most important for their future career, but they also feel they are most likely to need support with mathematics.
Keywords: mathematics education, online learning, vocational upper secondary education

INTRODUCTION
The main goal of our research project is to develop an asynchronous online mathematics course which would be applicable to vocational upper secondary students in various fields. The idea is that at least some of the applied tasks in this online course would be related to the student's own field so that the student could demonstrate mathematics proficiency via this online course while completing work assignments that require mathematics during her or his on-the-job training. The general idea is that this online course would be one of the options for completing mathematics studies, so, as a rule, students themselves would choose to participate in an online course. The background to our project is the reform in 2018 of vocational upper secondary education in Finland. Two of the aims of the reform were to increase learning in the workplace and to enhance students' personal learning pathways (National Audit Office of Finland, 2021).

In the development of online studies it is important to get to know the target group at the very beginning. Baldwin and Ching's (2019) Online Course Design Checklist (OCDC) states that students' knowledge base and interests should be analysed before the design of an online course. According to Benigno & Trentin (2000), for example, students' ICT skills and previous experience with online learning can be examined in advance. For this reason, our project commenced with a survey of students' ICT self-assessments and views regarding the importance of ICT skills from the perspective of their future career (Suominen et al., 2021). In this article attention was then paid to what students expect from online learning. Of particular importance were students' attitudes to online learning, including its perceived flexibility and the ways in which it might be provided.

The online mathematics study undergoing development in our project is intended to be completed, at least in part, in the context of on-the-job training. Since some of the mathematics tasks are related to work tasks, it is assumed that the student will complete some of the mathematics assignments with the aid of a device that is always with him or her, in other words, a phone. Another key device for completing online studies is a computer. With the extension of the compulsory education, which came into force in Finland in 2021, the necessary educational materials and equipment will be free of charge for those upper secondary students who are "within the scope of extended compulsory education" (Ministry of Education and Culture, 2021). As a result of the extension of compulsory education, it is expected that more vocational students have been equipped with a (laptop) computer by their educational institutions. From the perspective of developing online learning, it is important that students have the necessary learning tools. In addition, it is important to outline how students view the use of these devices. For this reason, attention was paid to the ways in which students view the use of the phone and the computer in their studies.

One area of interest consists of students' views on interaction with an online teacher or fellow students. New unified assessment criteria have been developed for the common units of the vocational upper secondary qualification in Finland (Finnish National Agency for Education, 2021a). These criteria brought into use in August 2022. One of the topics of the assessment is interaction (Finnish National Agency for Education, 2021b), and the present article provides a certain amount of information about the student's expectations of interaction in online learning. The findings of the part of survey concerning online learning will be used to develop not only aspects of an online course in mathematics but also in relation to teaching other common units of the vocational upper secondary qualification online.

In this article attention will also be paid to how students at the beginning of their vocational education see their own skills in mathematics, whether they perceive mathematics as important for their future career and what they expect from studying mathematics as part of their vocational upper secondary education. It will be important to find out how students view, for example, the idea of studying mathematics either in the workplace or online.

REVIEW OF RELATED LITERATURE
In the course of time, online learning has become increasingly popular. In particular, the COVID-19 pandemic has led to a clear increase in online learning at all levels of education. This has resulted in a growing body of research on what makes online learning successful and satisfying. Student satisfaction is considered to be one of the indicators of the quality of online courses (Quality framework: The student satisfaction pillar, n.d.). In the following sections previous research related to the multidimensional factors affecting success and satisfaction in the context of online learning are reviewed so that they can later help to reflect our own findings concerning upper secondary vocational school students' views and expectations regarding online learning. This theoretical background also deals with aspects related to the process of studying of mathematics, such as students' attitudes and their mathematical self-efficacy.

Use of Smartphones and Computers in Studies
In our investigation the students' willingness to use a phone and a computer (whether a computer means a desktop computer or a laptop computer, was not specified in our questionnaire) in their studies were examined. E-learning material delivered via mobile devices such as mobile phones or tablet PCs can be defined as mobile learning (m-learning) (Ally, 2005). Göksu & Atici (2013) mention a laptop, tablet PC, personal digital assistant and smartphone as devices for mobile learning. Students use mobile devices in their everyday lives and the use of the smartphone, for example, is also popular for study purposes. In vocational education, mobile devices are used, for example, to support learning with supplementary exercises (Ricky & Rechell, 2015).

Yan et al. (2021) studied K-12 students' ($N = 1\ 048\ 575$) experience of online learning during the COVID-19 pandemic. They noticed that the majority of students used smartphones in their online learning, while only a quarter of the students used a computer. In turn, in Sungjeminla's (2022) study 91.83% of 159 undergraduate college students used smart phones for online classes. In their review article Sung et al. (2016) observed that 69.95% of learners using mobile devices achieved relatively better results than did the minority not using mobile devices with regard to the dependent variables associated with cognitive achievement. Gómez-García et al. (2020) noticed that in education centres where smartphones were used for educational purposes, students achieved better academic results. It has also been observed that mobile learning technology can increase students' conceptual understanding of some mathematical functions (Sincuba & John, 2017). Students' attitudes connected to the use of mobile devices in learning have been studied to some extent. For instance, Sincuba & John (2017) and Yang (2012) have noticed that students displayed positive attitudes to mobile learning. Students found that mobile learning offered them more opportunities to get more information and it also underpinned collaborative and pervasive learning (Yang, 2012).

In turn, students' computer use has also been studied previously, for example from the perspective of accepting online learning (or e-learning. To check out our discussion of the terms *online learning*, *e-learning*, *distance learning*, and *virtual learning*, please see Suominen et al., 2021). Previous studies have found that the *acceptance* of students' e-learning is influenced, for example, by their individual previous experience of personal computers (Selim, 2007), by their confidence or knowledge of computer use (Keller et al., 2007) and by their computer self-efficacy (Kang & Shing, 2015). Concomitantly, students' *satisfaction* with e-learning is influenced, for example, by their knowledge of the various Internet technologies (Yalman et al., 2007) and by their level of computer-anxiety (Sun et al., 2008). Hence, in our first article vocational students' basic ICT skills self-assessments were examined (Suominen et al., 2021).

Attitudes to Online Learning

When teaching is transferred online, finding out students' attitudes and expectations helps in the creation of online learning that is suitable for the students. As mentioned above, previous studies have examined the impact of students' previous knowledge of computer and Internet technologies on the extent to which they accept and are satisfied with online learning. This section also reviews the influence of other factors studied, such as gender, age and residential area, on attitudes towards online learning. Rhema & Miliszewska analysed (2014) the attitudes to e-learning expressed by 348 undergraduate engineering students at two Libyan universities. The study showed that students' attitudes to e-learning were mainly positive and there were no significant differences between the genders or the students' locations (urban/rural). For their part, Peytcheva-Forsyth et al. (2018) observed the attitudes and perspectives to online learning held by 590 undergraduate students at a Bulgarian university. The researchers noticed, for example, that age will have an impact on whether a student returns his or her homework online rather than in person: among 18–21-year-olds, 61.2% of respondents prefer to return papers online, while the corresponding percentage for those over 25 years of age is only 7.1%. In contrast, in the study produced by Fredericksen et al. (2019), the results of which date back to 1999, the 16–25-year-olds were the least satisfied and the 36–45-year-olds were the most satisfied with on-line learning. The youngest (16–25) students also felt they were learning the least, while the 36–45-year-olds, from their perspective, learned the most (Fredericksen et al., 2019).

The COVID-19 pandemic has led to a rapid transition from in-person to online learning around the world. In connection with this, numerous research articles have already been published on such aspects as students' perceptions and attitudes towards online learning. Although our research relates to situations where a student voluntarily chooses an online learning opportunity, and hence the context differs from those of COVID-19-related research, these new studies provide a wealth of useful information about students' online learning experiences. Hussein et al. (2020) investigated undergraduate students' ($N = 45$) attitudes to emergency online learning in Abu Dhabi during COVID-19. According to their study, the aspects of emergency online learning that were most frequently considered positive were "cost- and time-effectiveness, safety, convenience and improved participation". In turn, the aspects of emergency online learning that were most frequently considered negative were "distraction and reduced focus, heavy workload, problems with technology and the internet, and insufficient support from instructors and colleagues" (Hussein et al., 2020). In turn, Malkawi et al. (2021) examined the satisfaction levels and attitudes of students at the United Arab Emirates University with respect to their e-learning and virtual classes during COVID-19. Their research showed that students were satisfied with e-learning and virtual lessons and the study did not find a significant difference between students' satisfaction level and, for example, gender or college (Science / Humanities and Social Sciences / Engineering and Information Technology). A significant difference was, however, found between students' satisfaction and attitudes and the educational level: fourth-year students were significantly more satisfied than first-year students (Malkawi et al., 2021).

Interaction in Online Learning

In the context of online courses, interaction becomes particularly important since the courses typically include less or not at all traditional classroom teaching, which means that teacher-student interaction and student-student interaction happens largely with the aid of technological tools. Interaction between teachers and students includes for example, discussions, asking and answering questions, and the teacher providing students with feedback. In the online learning context interaction can, for example, be both synchronous via videoconferences and online chats and asynchronous via e-mails and discussion boards (Alamri & Tyler-Wood, 2017). The Quality Framework promoted by the Online Learning Consortium suggests that appropriate, constructive and substantive interaction with the educators and peers is one of the key factors influencing student satisfaction in the context of online learning (Quality Framework: The student satisfaction pillar, n.d.).

In Alqurashi (2018) study on fully online courses it was found that good interaction with the course instructor and the learning content predicted higher satisfaction and perceived learning among university students. Learner-

learner interaction, in turn, was not found to be a significant predictor of satisfaction and perceived learning. Ishak et al. (2020) noticed that studying in the flipped learning classroom with the aid of asynchronous online video lectures offered university students more chances to interact with their peers and the instructor than traditional lectures. In the case of a study by Peytcheva-Forsyth et al. (2018) it was shown that there is a gender difference involved in whether a student wants to receive support from a teacher in an electronic environment. 50.6% of male respondents would like to receive support from their teacher in online learning either always or sometimes, compared with just over 90% of female respondents.

Game-Based Learning and Gamification

When online learning is undergoing development, one aspect may be related to the utilization of gaming features in online courses. *Game-based learning* means the "use of games to enhance the learning experience", while *gamification* means "adding game elements on a non-game situation" (Al-Azawi et al., 2016). A literature review by Antonaci et al. (2019) reveals that points, badges, levels, and narratives are some of the game elements used in online learning environments. Luo (2021) explored the topic of *educational gamification* by analysing 44 related articles. The study resulted in two redefinitions. According to the researcher's interpretation, *game elements* refers to "the obvious game-like elements that are frequently used in digital games or gamification, which are concrete nouns" and *gamification mechanisms* to "the underlying guidelines that make gamification activities engaging, which are abstract nouns that relate to humans' innate psychological needs". In Luo's analysis of the articles, she found that several factors such as goal, immediate feedback, challenge and reward make gamification engaging.

Gamification has emerged in recent years as one of the methods of enhancing students' engagement and motivation in online learning activities. Many studies have been devoted to the topic, and reviews of the literature have revealed that education and learning are actually the most common contexts of empirical research into gamification (Majuri et al., 2018). In the context of online learning, the effects of game design elements seem to be diverse. The literature review from Majuri et al. (2018) reveals that "a considerable majority of the reviewed studies reported mainly positively oriented results" but "there is also a significant amount of research with null or mixed results." Türkmen and Soybas (2019) studied the effect of gamification on students' attitudes and achievements in fifth-grade mathematics classes in Turkey. In their experiment they found no significant differences between the experiment group and the control group in terms of either achievements or attitudes. In contrast, Papp (2017) conducted an experiment using the concepts of gamification and involving six business communication classes of college students and two mathematics classes for grade four students in Canada. Papp found that in the case of both of the groups the students' motivation and engagement increased, and the students' experiences about learning with the use of gamification were positive. In addition, Faghihi et al. (2014) developed a gaming environment for college algebra in the US and got positive results of using it in their experiment.

Mathematics and Future Careers

As the topic of the online course to be developed is mathematics, it will also be worth looking at students' views and attitudes related to mathematics and studying mathematics. Student perceived utility value of particular courses or tasks from the perspective of one's future goals influences on students' behaviour and increases students' engagement in education (Eccles & Wigfield, 2002). Previous research has shown how students' value beliefs in mathematics tend to decline during adolescence (Watt, 2004). There are, however, very few studies in existence that investigate, in particular, upper secondary-level vocational school students' perceptions of the value of mathematics in terms of their future careers.

Dalby & Noyes (2015) studied groups of students in the construction and hairdressing in England. The results obtained from three large Further Education colleges showed that when the teaching and classroom pedagogy are organized in such a way that mathematics is integrated into the vocational experience, they "impact positively on student engagement and attitudes to learning mathematics".

In a recent Finnish national assessment of learning outcomes in mathematics in 9th grade, it was found that mathematics is generally perceived as useful (Metsämuuronen & Nousiainen, 2021). However, according to the results of the assessment, mathematics is not necessarily a subject to be liked.

Self-efficacy, Anxiety and Ability Self-perceptions in the Context of Studying Mathematics

Becoming aware of students' mathematics self-efficacy, mathematics anxiety and their self-perceptions of their mathematics ability is important when developing online courses and planning how to provide support in the online learning environment, especially for those students who struggle with the study of mathematics. Student *self-efficacy* is a notable element that needs to be considered when thinking about successful and satisfying online learning experiences, since self-efficacy beliefs affect performance expectations and behaviour. With respect to

mathematics self-efficacy, research conducted on particularly vocational school students' mathematics self-efficacy is marginal.

Yüksel & Geban (2015) focused on the prediction of vocational high school students' science and mathematics course achievements in terms of their self-efficacy and anxiety. Their study has shown that the variables predicting academic achievement differ according to course type. They found that student anxiety did not correlate with personal achievements in a chemistry or biology course. While *state anxiety* was observed to predict achievement in maths, *trait anxiety* predicted achievement in physics (see Yüksel & Geban (2015) for the explanation of the terms.). With regard to self-efficacy, their study found a positive correlation between academic self-efficacy and achievement in physics, chemistry and mathematics courses. In the case of a biology course, in turn, student self-efficacy predicted achievement. In a study by Zwart et al. (2020), senior secondary vocational school nursing students' mathematics self-efficacy decreased during a period of learning medical mathematics for which the students were required to use digital learning materials. Students' self-efficacy, however, did not affect their mathematics learning. Zwart et al. (2020) suggest that in the context of online education the teacher's role should not only encourage feedback as a part of completing assignments but also support students socially with respect to their sense of efficacy. Ozdemir & Onder-Ozdemir (2017) investigated Turkish Vocational and Technical High School students' ($N = 165$) *perceptions* as mathematics learners. Their study revealed that the reasons underlying students' perceptions were linked especially with students' perceived effect of their educational background on learning, perceived mathematics abilities and perceived behavior and actions in the mathematics course. In addition, students' views on their mathematics teacher and the milieu where the learning took place, were factors that influenced some students' perceptions.

Mathematics Learning Environments

When starting their vocational secondary education young students, in particular, may encounter completely unfamiliar learning environments regarding their study of mathematics. The items in our questionnaire related to the study of mathematics included three learning environments: online, an on-the-job training place, and a classroom. Previous research into vocational students' own views concerning the effect of learning environments on their mathematics learning is marginal. There is, however, research into the impact of learning environments on scores achieved in mathematics and also of knowledge of domain-specific mathematics in the context of vocational education. Zwart et al. (2017) studied the effect of Digital Learning Material (DLM) on the mathematics learning outcomes of apprenticeship students in vocational education in the Netherlands. They found that DLM which included, for example, instructional clips and online guidance "helped vocational education students improve their mathematics scores" and that "the implementation of DLM improved students' domain-specific mathematics knowledge for both numbers and proportion domains except for the geometry topic."

Frejd & Muhrman (2020) observed two mathematics lessons taught at an upper secondary vocational education and training school. One of the classes was conducted in a hairdressing salon (i.e., in a vocational classroom) and the other in a mathematics classroom. The researchers found that studying mathematics related to a specific field in an authentic environment rather than a conventional classroom increased discussion amongst the students about their mathematics topics. In the salon, for example, students were more likely to ask each other for help, while in a conventional mathematics classroom students expected the teacher to help (Frejd & Muhrman, 2020).

RESEARCH QUESTIONS

Our research is designed to help us develop an online course in mathematics that includes field-specific theoretical material, examples, learning assignments, and assessed assignments. The online course should permit students from different vocational fields to work along different learning paths. In order to produce learning paths that would be suitable for each field, there is a need to discover the views and expectations of students in different vocational fields with respect to online learning and mathematics. While many studies focus on online learning at the level of higher education, only limited research exists that focuses specifically on secondary level vocational students' views and expectations. Hence, the following research questions were drawn up:
1. How do students view online learning?
2. What do students expect from online learning?
3. What do students think of their own mathematics skills?
4. What do students expect from studying mathematics at vocational school?

All of the research questions are examined from the perspective of the various vocational fields.

METHODOLOGY
Data Collection Methods
A questionnaire was devised that would enable us to investigate Finnish upper secondary vocational school students' views and expectations regarding online learning and studying mathematics. The questionnaire was developed with the assistance of two online teachers from other subject areas, since there was also the intention to apply the results of the study to other online courses. The questionnaire was piloted with 18 students in Spring 2017. Following the pilot study, details of educational background were added to the demographic questions. A control question "Select 4 if you read this question" was also added in order to make sure that the students had really read the questions before responding. The parts of the questionnaire concerning online learning and studying mathematics did not require any modifications after piloting.

A total of 30 orientation information sessions, concerning either a combination of studying in a vocational school in general and online learning or online learning alone, were used to distribute the final version of the questionnaire. Approximately 920 students who were about to start their vocational upper secondary education participated in these sessions. At the start of the segment of the sessions concerning online learning the organizers introduced themselves and showed two short videos about online learning. Subsequently, the students answered the questionnaire using their mobile devices.

The questionnaire contained a total of 58 questions. Five of the questions were related to the students' demographic information, i.e., their gender, age, educational background, field of vocational education and training, and previous experience of online learning. In this study the demographic information as a point of interest lies in the field of vocational education and training. Two of the questions were designed for the purpose of checking the data later, if necessary. A total of 29 of the questions related to basic ICT skills, such as saving files onto the cloud service or knowing the basics of a spreadsheet programme, while two of the questions related to students' opinions concerning the usefulness of ICT skills. The results related to these issues were evaluated in our previous article (Suominen et al., 2021). In the present article 18 questions have been dealt with that related to students' views and expectations concerning online learning and studying mathematics. Additionally, students who wanted to participate in a subsequent lottery were asked in the final question of the questionnaire to leave their contact information.

Sample
A total of 865 students starting their upper secondary vocational education responded to the questionnaire. A total of 32 students answered the control question incorrectly and one of the students used a fake name. In addition, representatives (8 students) of the gender option "Other" had to be left out due to ambiguities related to the answers. Thus, the size of the final research material was 824 students. Of the respondents, 409 (49.6%) were female and 415 (50.4%) were male. The gender distribution of the respondents in their respective fields is shown in Table 1. Table 1 also shows the number of respondents in the various vocational fields.

Table 1. Percentage of female and male respondents in the various vocational fields[a]

Vocational field (number of respondents)	Percentage of female and male respondents
Agriculture and Forestry ($N = 27$)	25.9% - 74.1%
Business, Administration and Law ($N = 120$)	49.2% - 50.8%
Health and Welfare ($N = 179$)	79.9% - 20.1%
Humanities and Arts ($N = 128$)	48.4% - 51.6%
Information and Communication Technologies ($N = 32$)	9.4% - 90.6%
Service Industries ($N = 163$)	68.7% - 31.3%
Technology ($N = 175$)	13.1% - 86.9%

[a] Nowadays, the fields of Finnish vocational education and training are different than in 2017. Some vocational qualifications are, for example, located under different vocational fields, e.g., in 2017 vocational qualifications in ICT Technician and Property Maintenace Operative were part of Technology, Communication and Transportation. Nowadays, it should be noted, the former is part of Information and Communication Technologies, and the latter is part of Service Industries. All of the respondents are categorized according to current fields of vocational education and training. There were respondents from seven current vocational fields in our questionnaire survey.

The majority of respondents were 16–17 years old ($N = 367$, 44.5%), while the second most common age group consisted of those under 16 years of age ($N = 137$, 16.6%). The most common educational background of respondents was comprehensive school ($N = 584$, 70.9%). Only 32.8% ($N = 270$) of respondents had completed online studies before.

Data Analysis Methods
Two types of variables were used in our quantitative research. The field of vocational education and training was an independent variable, while the dependent variables consisted of students' opinions regarding the online learning and study of mathematics. The data analysis started with a calculation of the mean values and standard deviations for the students' responses in Likert scale questions. In addition, the percentages of respondents selecting the different options were calculated. Next, the Kruskal-Wallis test was used to find out if there were statistically significant differences between the responses of students from seven vocational fields. Question 43 was a multiple-choice question with several correct options to choose from. In connection with this question, the number of students who chose different options was investigated. The data was analyzed using IBM SPSS Statistics software (version 27) and the reporting of the results has been guided by Field (2018).

RESULTS
In this section, students' views and expectations concerning online learning and studying mathematics are examined in relation to our survey.

Students' Views and Expectations Concerning Online Learning
The means and standard deviations of views and expectations concerning online learning by field of vocational education are presented in Appendix A; the percentages of respondents selecting the options "completely disagree" or "disagree", "neither agree nor disagree" and "largely agree" or "completely agree" appear in Appendix B; and pairwise comparisons using the Kruskal-Wallis test are presented in Appendix C.

Use of Smartphones and a Computers in Studies
Consideration will be first paid to the use of smartphones and computers in the performance of studies. In the claim "I would be happy to use a phone for my studies", the means varied between $M = 3.26–3.74$, the percentages for the two best options "largely agree" or "completely agree" between 37.0–65.9%, and for the two worst options "completely disagree" or "disagree" between 9.2–26.6%. In light of the means, the percentages of two best options and the for the two worst options, Agriculture and Forestry ($M = 3.26$; 37.0%; 22.2%) and Humanities and Arts ($M = 3.26$; 46.1%; 26.6%), were most negatively related to the use of the smartphones in connection with the studies. In turn, the means and the percentages of the two best options for using a phone for the studies were highest in the fields of Service Industries ($M = 3.74$; 65.0%) and Health and Welfare ($M = 3.73$; 65.9%). These results are partly reflected in pairwise comparisons: In pairwise comparisons using the Kruskal-Wallis test two statistically significant pairwise comparisons appeared in the claim "I would be happy to use a phone for my studies" ($H(6) = 19.729$, $p = 0.003$). Students in Humanities and Arts were significantly less likely to suppose that they would be happy to use a phone for their studies compared with students in Service Industries ($p = 0.005$, $r = -0.21$) and Health and Welfare ($p = 0.009$, $r = -0.20$).

In the claim "I want to use a computer a lot in my future studies" Agriculture and Forestry had the lowest mean ($M = 3.00$) and the largest percentage for the two worst options (29.6%), while, as could have been predicted, Information and Communication Technologies had the highest mean ($M = 4.62$) and the largest percentage for the two best options (96.9%). When Information and Communication Technologies is omitted, Business, Administration and Law has the highest mean $M = 3.93$. This claim ($H(6) = 57.981$, $p = 0.000$) was significantly affected by the vocational field. Students in Information and Communication Technologies wanted to use computers a lot in their future studies significantly more often than did students from any of the other fields: Service Industries ($p = 0.000$, $r = -0.37$), Health and Welfare ($p = 0.000$, $r = -0.38$), Humanities and Arts ($p = 0.000$, $r = -0.39$), Technology ($p = 0.000$, $r = -0.45$), Agriculture and Forestry ($p = 0.000$, $r = -0.79$) and Business, Administration and Law ($p = 0.003$, $r = -0.31$). In addition, students in Business, Administration and Law wanted to use a computer a lot in their future studies significantly more often than did students from two other fields: Agriculture and Forestry ($p = 0.002$, $r = 0.32$) and Technology ($p = 0.002$, $r = 0.23$).

Attitudes to Online Learning
Next, attention will be paid to claims related to the opinions expressed about online learning. The means for the claim "Some of your studies will likely be independent online studies. Questions 42–48 relate to online learning. I would be happy to study online" varied between $M = 3.22–3.97$. Agriculture and Forestry and Humanities and Arts had the largest percentages for the two worst options (25.9% and 25.8%, respectively) and the lowest percentages for the two best options (48.1% and 49.2%, respectively) while Information and Communication Technologies and Business, Administration and Law had the lowest percentages for the two worst options (3.1% and 3.3%, respectively) and the largest percentages for the two best options (71.9% and 60.8%, respectively). There were no statistically significant differences between the vocational fields in the opinions expressed at $p > 0.05$ in this claim.

The claim "I believe online learning is a flexible way to study" had relatively high means (M = 3.48–4.25) and percentages for the two best options (51.9–81.3%). Only the means and percentages obtained for Agriculture and Forestry (M = 3.48; 51.9%) and Technology (M = 3.59; 57.1%) were below 3.80 and 65%, respectively. The percentages for the two worst options varied between 0.0–14.8%. When there were two statistically significant pairwise comparisons in total in this claim (H(6) = 31.617, p = 0.000), Technology was included in both comparisons. Students from Technology were significantly less likely to agree with the claim than did students from Health and Welfare (p = 0.000, r = -0.24) and Information and Communication Technologies (p = 0.002, r = -0.27).

Interaction and Instructions in Online Learning
The questionnaire contained three claims related to interaction or instructions in an online learning environment. With respect to interaction with the teacher, students from the various vocational fields considered it quite important to be able to ask the teacher for help in the chat: In the claim "I want it to be possible in an online learning environment to ask for advice from an online teacher through chat" the means (M = 3.62–4.13) and the percentages for the two best options (54.9–81.0%) were relatively high and the percentages for the two worst options (3.1–7.4%) relatively low. The means and the percentages for the two best options show that the possibility of asking the teacher for help in chat was most important for students taking Health and Welfare (M = 4.13; 81.0%) and least important for students of Technology (M = 3.62; 54.9%). With respect to the claim "I want it to be possible in an online learning environment to ask for advice from an online teacher through chat", the opinions were significantly affected by the vocational field (H(6) = 38.954, p = 0.000). Pairwise comparisons showed that there were significant differences between the opinions of students studying Technology and those studying Health and Welfare (p = 0.000, r = -0.30), Humanities and Arts (p = 0.001, r = 0.24) and Service Industries (p = 0.037, r = 0.17). Comparison of the mean ranks (see Appendix C) shows that students representing Technology were significantly less likely to agree with the claim than students from the other three vocational fields mentioned above. In addition, students from Health and Welfare were significantly more often than students from Business, Administration and Law of the opinion that the possibility to connect with their teacher via chat was important (p = 0.046, r = -0.18).

Chatting with other students in an online learning environment was not considered as important as the possibility to chat with the teacher. With respect to the claim "I want to chat with other students in an online learning environment" the means varied between M = 2.96–3.56, while the percentages for the two best options varied between 29.6–54.7% and for the two worst options between 9.4–25.9%. In pairwise comparisons using the Kruskal-Wallis test there appeared only one statistically significant pairwise comparison related to this claim (H(6) = 18.661, p = 0.005). Students in Health and Welfare regarded chatting with other students in an online learning environment as significantly more important than did students in Technology (p = 0.004, r = -0.20).

The way in which question 43 was implemented differed from the other questions: The question was not a Likert question but multiple-choice, where students were permitted to choose several options. Table 2 shows the question set used for this item, the answer options, and the numbers and percentages of students who selected each option. The results show that the final option "Verbal instructions would be sufficient" was the most popular. It is noteworthy that many students who chose the last option had also chosen at least one other option. As many as 33 students chose all four options. According to the students' choices, "Read aloud" was by far the least preferred option.

Table 2. Number of respondents selecting the various options of multiple choice question 43: "How would you like the online learning instructions to be given? You can choose several options."

Option	Frequency and percentage of all respondents
Using pictures	385 (46.7%)
Read aloud	107 (13.0%)
As a video guide	320 (38.8%)
Verbal instructions would be sufficient	528 (64.1%)

The choices made for question 43 by field of vocational education are presented in Appendix D. It is noted that the option "Using pictures" was the most popular among students of Health and Welfare, while the option "Read aloud" was favoured by students of Service Industries and the option "As a video guide" by students in Humanities and Arts. In contrast, all of the three options were the least popular among students in Information and Communication Technologies (in the option "As a video guide" Service Industries received the same percentage). The percentages for the option "Verbal instructions would be sufficient" were remarkably high in all fields.

Students in Information and Communication Technologies chose this option most frequently, while students in Technology favoured it least.

Game-Based Learning and Gamification
The last three questions in the questionnaire related to online learning were about game-based learning and gamification. The claim "It would be nice if the online course had been made like a game" had relatively low means (M = 2.88–3.44). The percentages for the two best options varied between 25.9–53.1% and for the two worst options between 18.3–35.9%. There were no statistically significant differences between the vocational fields in the opinions at p > 0.05 in the claim "It would be nice if the online course had been made like a game".

In the claim "I want a learning game or software to give immediate feedback on my success" the means ranged from M = 3.33 (Agriculture and Forestry) to M = 3.80 (Health and Welfare). The percentages for this claim were distributed as follows: 40.6–63.3% for the two best options and 6.1–18.8% for the two worst options. In pairwise comparisons using the Kruskal-Wallis test two statistically significant pairwise comparison appeared for this claim ($H(6)$ = 24.464, p = 0.000). The immediate feedback was significantly less important for the students in the field of Technology than for the students in Health and Welfare (p = 0.001, r = -0.22) or Humanities and Arts (p = 0.002, r = 0.22).

In the claim "I find it important to see my progress in a learning game, for example, described using different levels (e.g., bronze, silver, gold)" the means were M = 3.26–3.60, the percentages for the two best options 33.3–56.4% and for the two worst options 8.3–20.3%. In this claim *($H(6)$ = 13.593, p = 0.035)*, students in Health and Welfare considered it significantly more important to see their progress described using different levels than did students in Technology (p = 0.025, r = -0.17).

A summary of Kruskal-Wallis analyses of online learning claims
When the Kruskal-Wallis test was used in pairwise comparisons, there appeared statistically significant differences between some vocational fields in 7 claims out of 9. When there were 20 statistically significant pairwise comparisons in total, Technology was involved in 11 of those cases. In all of these cases, the mean rank of Technology was lower than that of the other field in the pairwise comparison. This means that students in the field of Technology were less enthusiastic about, for example, the various interaction possibilities in the online learning environment offered than were students in some of the other fields.

Students' Views and Expectations concerning Studying Mathematics
The means and standard deviations of views and expectations concerning studying mathematics according to the various fields of vocational education are presented in Appendix E. Similarly, the percentages of respondents selecting the options "completely disagree" or "disagree", "neither agree nor disagree" and "largely agree" or "completely agree" in Appendix F and pairwise comparisons using the Kruskal-Wallis test are presented in Appendix G.

Mathematics and Future Careers
First, consideration will be paid to claims related to the connection between mathematics (taught in vocational training) and students' future careers. Generally speaking, mathematics was seen as relatively important for future careers. For the claim "Questions 50–56 deal with the connection between mathematics and your future career and studying mathematics. I will need mathematics in my future career" the means were M = 3.80–4.35, the percentages for the two best options 64.8–83.8% and the percentages for the two worst options 0.0–9.4%. Humanities and Arts had the lowest mean (M = 3.80), the largest percentage for the two worst options (9.4%) and the lowest percentages for the two best options (64.8%). When Humanities and Arts is omitted, the percentages for the two worst options were only 0.0–2.5%. This claim ($H(6)$ = 43.524, p = 0.000) was significantly affected by the vocational field. When there was a total of 4 statistically significant pairwise comparisons in this claim, Health and Welfare was involved in 3 of them. Students in the field of Health and Welfare were significantly more likely to suppose that they were going to need mathematics in their future careers, compared with students in Service Industries (p = 0.000, r = -0.24), Humanities and Arts (p = 0.000, r = -0.32) and Information and Communication Technologies (p = 0.030, r = 0.22). In addition, students in Humanities and Arts were significantly less likely to suppose that they were going to need mathematics in their future careers than were students in Business, Administration and Law (p = 0.001, r = -0.25).

The students from various vocational fields did not agree with the claim "I want to study mathematics more than the jobs of my future career would require". The means were M = 2.36–2.78, the percentages of the two best options 12.9%–22.2%, and the percentages for the two worst options 34.3–55.5%. Based on pairwise comparisons, students representing Business, Administration and Law approached the study of mathematics to a level beyond

the requirements of their future careers significantly more positively than did students from Humanities and Arts ($p = 0.027$, $r = -0.20$) or Service Industries ($p = 0.030$, $r = 0.19$).

The two claims "It is enough for me that the stories, examples and tasks involved in studying mathematics are related to everyday life and work tasks in someone else's field, they do not have to be related to my own field" and "It is important that the mathematics taught in vocational training (stories, examples, and assignments) is closely related to the work assignments in my own field" were the opposite of each other, and this is reflected in the students' responses. The means varied between $M = 2.84$–3.31 for the first of these two claims and $M = 3.31$–3.73 for the second. The percentages for the two worst options were 12.5–31.8% for the first of these two claims and 0.0–10.9% for the second. The percentages for the two best options were 20.1–37.5% and 34.4–64.8%, respectively. There were no statistically significant differences between the vocational fields in the opinions at $p > 0.05$ in the claim "It is enough for me that the stories, examples and tasks of studying mathematics are related to everyday life and work tasks in someone else's field, they do not have to be related to my own field". For the claim "It is important that the mathematics taught in vocational training (stories, examples, and assignments) is closely related to the work assignments in my own field" ($H(6) = 58.865$, $p = 0.000$), students from Health and Welfare were significantly more likely to think that it was important that the mathematics taught in vocational educations is closely related to the work assignments in their own field compared with students in Business, Administration and Law ($p = 0.004$, $r = -0.22$) and Service Industries ($p = 0.047$, $r = -017$).

Ability Self-perceptions and Self-efficacy in the Context of Studying Mathematics and the Perceived Need for Support
In this section attention will be paid to students' views regarding the relative easiness with which mathematics could be learned and the need for support in studying mathematics. For the claim "Mathematics is easy for me" the means were $M = 2.93$–3.41, the percentages for the two worst options 11.1–35.9%, and the percentages for the two best options 30.7–40.6%. Health and Welfare had the lowest mean and the lowest percentage for the two best options, while Agriculture and Forestry had the highest mean and the lowest percentage for the two worst options. There were no statistically significant differences between the vocational fields in the opinions at $p > 0.05$ in this claim.

In turn, the claim "I need support in studying mathematics (e.g., from a teacher, a classmate, parents)" was significantly affected by vocational field. Health and Welfare had the highest mean $M = 3.31$, while for the other vocational fields the means for this claim varied between $M = 2.56$ and $M = 3.03$. Health and Welfare also had the lowest percentage (24.6%) for the two worst options (other fields: 31.9–46.9%) and the highest percentage (46.9%) for the two best options (other fields: 18.5–38.7%). When there were three statistically significant pairwise comparisons in total for this claim ($H(6) = 27.609$, $p = 0.000$), Health and Welfare was included in every comparison. Students of Health and Welfare felt the need for support in studying mathematics significantly more frequently than did students of Business, Administration and Law ($p = 0.002$, $r = -0.23$), Technology ($p = 0.006$, $r = -0.19$) and Information and Communication Technologies ($p = 0.016$, $r = 0.23$). It should be noted, however, that in light of the means, the need for support was not remarkable high in any vocational field.

Mathematics Learning Environments
Finally, consideration will be paid to students' opinions of mathematics learning environments. In the claim "Studying mathematics online sounds like an interesting opportunity", Humanities and Arts had the lowest mean ($M = 2.87$) and the largest percentage for the two worst options (34.4%) while Business, Administration and Law had the highest mean ($M = 3.49$) and the largest percentage for the two best options (47.5%). There was only one statistically significant pairwise comparison for this claim ($H(6) = 17.903$, $p = 0.000$), and it was between the various fields listed above ($p = 0.002$, $r = -0.25$).

Humanities and Arts also had the lowest mean ($M = 2.50$) and the largest percentage for the two worst options (46.1%) for the claim "I want to study mathematics in an on-the-job training place rather than a classroom". Agriculture and Forestry had the highest mean ($M = 3.44$), the lowest percentage for the two worst options (11.1%), and the largest percentage for the two best options (37.0%). Students in Humanities and Arts expressed the opinion with significantly less frequency ($H(6) = 21.932$, $p = 0.001$) that they wanted to study mathematics in an on-the-job-training place rather than a classroom than did students in Agriculture and Forestry ($p = 0.001$, $r = -0.33$) or Technology ($p = 0.020$, $r = -0.19$).

A summary of Kruskal-Wallis Analyses of Mathematics Claims
When the Kruskal-Wallis test was used in pairwise comparisons, there appeared statistically significant differences between some vocational fields in 6 claims out of 8. When there were 14 statistically significant pairwise comparisons in total, Health and Welfare was involved in 8 of those cases. In all of these cases, the mean rank of

Health and Welfare was higher than that of the other field in the pairwise comparison. In these claims, it should be noted that high mean rank signified different things, depending on the claim. A high mean rank could, for example, signify a student's perception that mathematics is important for his or her future career, while, on the other hand, the student felt they needed support in studying mathematics.

DISCUSSION

New vocational students' views and expectations concerning online learning and studying mathematics have been examined in this study. Of particular interest were the differences between the views and expectations of students in seven different vocational fields. This study will contribute to the research into the development of online courses, especially in mathematics but also in other subjects, and the organization of mathematics studies designed for vocational upper secondary level students.

Research question 1, "How do students view online learning?", can be considered first from the perspective of how students view the use of two devices used in online learning, a smartphone and a computer, in their own studies. Although previous research (e.g., Sincuba & John, 2017; Yang, 2012) has found that students have positive attitudes toward mobile learning, it is also clear that not all students representing all of the vocational fields in our survey were initially very enthusiastic about using their phones in their studies. Students in Humanities and Arts were significantly less likely to suppose that they would be happy to use phones in their studies, compared with students in Service Industries and Health and Welfare. In turn, students' views on whether they wanted to use computers extensively in their studies depended significantly on what vocational field the students were representing. As expected, students in Information and Communication Technologies were willing to use computers extensively in their future studies, especially in comparison with students in any of the other fields.

Attention was paid in our previous article to students' perceptions of their own basic ICT skills (Suominen et al., 2021). According to the results of our survey it was found that students in all fields felt that they were very familiar with how to take photos on a smartphone. Thus, if it can be assumed that this is true, assignments could be set in a mathematics online course that would require students to take photographs of mathematical work tasks appropriate to their field. However, if some students are of the opinion that they do not particularly enjoy using a phone for study purposes, ways should also be found to design online learning activities that might help students to realise the potential of the phone as a convenient learning tool. It can be assumed that if the use of particular tools is not to be considered a problem, students will be better able to focus on acquiring a proper working knowledge of the substance of mathematics, for example. The same holds true with regard to using a computer. Although some studies show that students make more use of a phone than a computer in their online studies (Sungjeminla, 2022; Yan et al., 2021), it is known from experience that our students nevertheless frequently work on their online studies with the aid of a computer. One reason for this is that many online learning activities work better on a computer. In addition, although raising the compulsory school age in Finland does not directly mean that students will automatically have access to computers, the Ministry of Education and Culture (2021) has also answered questions related to the topic that "it has been estimated in the cost calculations of the reform that, to be able to participate in instruction, each student should be equipped with a computer for the duration of their studies". Thus, as more and more young students have access to a (laptop) computer provided by an educational institution, it would be important for them to also discover how much more effective using a computer can be if it is used for study purposes.

Further consideration of research question 1 reveals that, generally speaking, students from the different vocational fields considered online learning to be quite a flexible way to study. Students in the fields of Agriculture and Forestry and Technology were the least likely to agree with the statement, especially those of Technology. Because online learning is often independent of time and place, in our experience it is frequently flexibility that is one of the positive features associated with online learning. It was found in an earlier study undertaken in Finland that for upper secondary school students ($N = 58$) flexibility of timetables was one of the reasons for favouring online studies (Kokko et al., 2021). But as can be seen from the present results, while students obviously see online learning as a flexible way of studying, they were less likely to agree with the statement "I would be happy to study online". However, the students' attitude was also found to be cautiously positive, and there was no statistically significant difference between the various fields with regard to this claim. It is also worth remembering that only a third of our respondents had previously completed any online studies. Katz et al. (2002) noticed that even if students were nervous about the nature of an Internet-based course, they were nevertheless capable of dealing with such a course successfully. Hence, it would be important to discover whether students' views about online learning change once they have experienced this mode of studying, especially if the outcome has been personally successful.

Research question 2 addresses students' expectations of online learning and relates, for example, to interaction and instructions. Results show that students from the various vocational fields expected that in an online learning environment they would be able to ask a teacher for help by means of chat. Students in the field of Health and Welfare considered this opportunity particularly important, while those in the field of Technology rated it as least important. In general, it was considered that chatting with other students in an online learning environment was less important than the possibility of chatting with the teacher. Students from Health and Welfare regarded chatting with other students in an online learning environment as significantly more important than did students in the field of Technology. These views are in line with the results reported by Alqurashi (2018), who found that in the context of fully online courses good interaction with instructor of the course and the learning content predicted higher satisfaction and perceived learning among university students. Learner-learner interaction, in turn, was not found to be such an important predictor of satisfaction or perceived learning in Alqurashi's (2018) study. In the case of our previous study (Suominen et al., 2021), it was found that students in Health and Welfare more frequently rated their basic ICT skills as weak than did students in many other vocational fields. The fact that students of Health and Welfare wanted a conversation to be possible in an online learning environment with both their teachers and with their fellow-students may be related to this uncertainty about information technology per se. Furthermore, the new unified assessment criteria in the common units of the vocational upper secondary qualification in Finland, brought into use in August 2022, include an assessment criterion related to the interaction itself (Finnish National Agency for Education, 2021a). The criteria are defined for grades 1–5. For example, a satisfactory assessment criterion grade of 1 for interaction is defined as "the student acts appropriately in familiar interactive situations", a good assessment grade of 3 means that "the student acts collaboratively in usual interactive situations", while a commendable assessment of 5 reveals that "the student acts collaboratively and constructively in varying interactive situations" (Finnish National Agency for Education, 2021b). Thus, different interaction situations and their evaluation play an increasingly important role also in online learning.

Regarding the presentation of the instructions for online learning, a majority of students in all fields chose the option "verbal instructions would be sufficient". Of the three other ways in which instructions were offered, by far the least popular was "read aloud". It is notable that many of the students who chose the option "verbal instructions would be sufficient" had also chosen at least one other option. It would be interesting to know if their choices were based on the idea that video instructions, for example, would be quite nice but that verbal instructions would suffice. Since more than 50% of the respondents in both Humanities and Arts and Health and Welfare chose instructions that used pictures, and since more than 50 % of the Humanities and Arts respondents expressed a preference for video instructions, it may well be worth considering providing instructions in both formats for future online courses.

With respect to research question 2, students in the various vocational fields did not expect an online course to be made like a game. In addition, students did not regard it as particularly important that in a learning game, for example, they should have the opportunity to see their progress expressed in terms of different levels (e.g., bronze, silver, gold). Immediate feedback on a student's success in an online learning game or software was regarded as the most important of the three claims related to game-based learning and gamification. This finding related to importance of immediate feedback is in line with Luo's findings (2021): When Luo looked at the articles related to the gamification in depth, she found that immediate feedback makes gamification engaging. In our research the immediate feedback was significantly less important for students in the field of Technology than for those in Health and Welfare or Humanities and Arts. Health and Welfare students also considered it to be significantly more important to see their progress described using different levels than did students in Technology.

Turning now to research question 3, which concerned students' perceptions of their own mathematics skills, there were no statistically significant differences between the vocational fields as to whether students felt that mathematics was easy for them. Although the need for support in studying mathematics was not remarkable high in any vocational field, students' experience of the need for support was significantly affected by their vocational field. Students from Health and Welfare felt the need for support in studying mathematics from a teacher, a classmate or parents, for example, significantly more frequently than did students from the other three vocational fields. As can be seen from Table 1, Health and Welfare is a very female-dominated field. Two of the vocational fields whose students experienced the least need for support (Technology and Information and Communication Technologies) were, in turn, male-dominated fields. Thus, it may be that gender is a significant factor in our consideration of the reasons for the differing needs for support. This view is indeed supported by the results of a recent Finnish national assessment of learning outcomes in mathematics in the 9th grade (Metsämuuronen & Nousiainen, 2021). According to findings of assessment, no difference exists between the genders in their overall knowledge of mathematics. However, the national assessment showed that as they have found in the course of the past ten years, girls undergo a significantly worse experience than do boys in terms of their mathematical skills. In other words, girls have a weaker mathematics self-efficacy than boys.

Research question 4 addresses students' expectations regarding the study of mathematics at a vocational school, for example, in terms of learning materials and learning environments. According to our results, students clearly want to study mathematics no more than their own career requires. The most positive attitude towards studying extra mathematics is maintained by students of Business, Administration and Law. It was also noticed that, although it is not remarkably important for the students from across the range of different vocational fields, that the mathematical examples and tasks discussed were related to their own field, it is obvious from the responses that students prefer to deal with mathematics through cases in their own field rather than examples drawn from general working life. The integration of mathematics into one's own field was especially important for students in the field of Health and Welfare. It is clear from the literature that the integration of mathematics into the field has had a positive impact on students' experience of studying mathematics at vocational school (Frejd & Muhrman, 2020; Dalby & Noyes, 2016). Current vocational upper secondary qualification requirements in Finland include four competence points for obligatory mathematics. There have been five targeted learning outcomes, including 14 assessment criteria in total in obligatory mathematics. Many of these criteria have included at least a mention of the individual student's own vocational field or working life in general. Instead, the targeted learning outcomes for mathematics in the new qualification requirements brought into use in August 2022 no longer contain any reference to the student's own vocational field, since references to working life are more common. It remains to be seen how this reform will affect the teaching of mathematics in Finland and thus students' attitudes towards mathematics in vocational education. The fact that students do not want to study mathematics to any more advanced level than is required by specific jobs in their field may be related to the fact that mathematics is not necessarily considered a subject to be liked. The above findings and conclusions are confirmed by the national assessment in Finland of learning outcomes in mathematics in the 9th grade (Metsämuuronen & Nousiainen, 2021). According to the assessment results, mathematics is generally perceived as useful but it is not necessarily a subject to be liked.

With respect to learning environments, students in the Humanities and Arts are the most skeptical concerning the idea of studying mathematics online or in an on-the-job learning place. In general, no students in any field reported themselves to be especially positive about the two learning environment options offered. Students in Agriculture and Forestry and Technology were the most positive about learning mathematics in the workplace. This may be because in many areas of technology mathematics is essentially work-related. Studying mathematics in the context of vocational subjects has been found to increase students' motivation vis-à-vis mathematics (Frejd & Muhrman, 2020). This option was not available in our questionnaire, so it would be interesting to discover whether students would be more positive about studying mathematics in a work environment if the study took place in a vocational class rather than in addition to on-the-job training.

In summary, when looking at statistically significant pairwise comparisons in claims concerning online learning, it can be observed that students in Health and Welfare and in Technology often have different views about particular issues. Students in Health and Welfare, with statistically greater frequency, believe that online learning is a flexible way to study, want to have the opportunity in an online learning environment to ask for advice from an online teacher through chat and chat with fellow-students, want a learning game or software to provide them with immediate feedback on their success and regard it as important that they their progress in a learning game, than do students of Technology. It has been noticed previously that students of Health and Welfare rate their personal basic ICT skills as significantly lower than do students in many other vocational fields (Suominen et al., 2021). Hence, the need for interaction and for diverse indicators of success may be associated with this uncertainty with basic ICT skills. On the other hand, it should be noted that uncertainty about basic ICT skills is not reflected in their assessment of online learning flexibility. With regard to the noticeably more negative attitude amongst students in the field of Technology, similar results were reported in our previous article concerning the need for IT skills: students in Technology felt that they need IT skills in their future careers significantly less frequently than did students in Humanities and Arts and in Health and Welfare (Suominen et al., 2021).

Health and Welfare also emerges in pairwise comparisons related to mathematics. Students in Health and Welfare are significantly more likely to suppose that they are going to need mathematics in their future career, that it is important that the mathematics taught in vocational training is closely related to the work assignments in their field, and that they need greater support in studying mathematics than students in many other fields. While students in Health and Welfare feel that mastering mathematics is important for their future careers and at the same time feel that they need help significantly more frequently in studying mathematics than do students in many other fields, it is important that they are provided with adequate support during their mathematics studies. It is also important to consider the role of gender in the experience of needing support. As mentioned before in this section, the results of the recent Finnish national assessment of learning outcomes in mathematics in the 9th grade show that girls have a weaker mathematics self-efficacy than boys (Metsämuuronen & Nousiainen, 2021). As some of

the fields in upper secondary vocational education are dominated by male students and others by female students, differences in mathematics self-efficacy among students in different fields of vocational education are likely to occur. Becoming aware of the needs of students in different fields promotes the quality of vocational education. In terms of future research, further investigations should be conducted particularly into vocational students' mathematics self-efficacy. Gender differences also occur, for example, in self-assessments related to web-use skills: According to observations made by Hargittai & Shafer (2006), women rated their skills as worse than those of men, although there were in fact no great differences in their real skills. Hence, it is important to recognize that both aspects of our research, mathematics and online activities, may involve a gender perspective.

It is worth remembering that only a third of respondents had completed online studies previously. In future research it would be useful to determine how students' experience of online learning affects their attitudes to online learning itself and also to the devices used in online learning and the aspirations connected with online learning. The same holds true for studying mathematics. Few students who responded to the questionnaire are likely to have had previous experience of studying mathematics in on-the-job training, so that their perception of the importance of mathematics for their future careers is based on their imagination. It should be noted that most of the students who responded to the questionnaire had come directly from comprehensive school to study for vocational upper secondary qualifications.

With respect to the further development of online courses, such as mathematics, but also in other fields, it will be important to discover students' opinions regarding the different solutions suggested by a pilot online mathematics course. Particular attention is being paid at present to whether students at the vocational upper secondary level take advantage of the recurrence opportunity. It will also be useful to find out what students think about the instructional video produced for the pilot study. It is known that major gaps may be present in the mathematics skills of students entering vocational education. An article by Lindberg & Grevholm (2011) deals with a developmental research project (the KAM-project, where in English KAM means "the mathematics of vocational subjects") which was conducted in Sweden in 1998–2002. In connection with the KAM-project, it had been noticed that although the students had previously passed their mathematics courses in their earlier formal schooling and had thus acquired the knowledge laid out in the curriculum, they did not have the necessary basic knowledge once they started their vocational training. There was already a learning deficiency in the mathematics syllabus covered at the beginning of their basic schooling, such as fractions. According to the article, the solution may be to ensure that students actually acquire adequate skills in their basic schooling rather than to lower the level of requirements for the first mathematics course (Lindberg & Grevholm, 2011). In turn, the recent Finnish national assessment of learning outcomes in mathematics in the 9th grade shows that that the level of mathematics competence has fallen significantly in comparison with previous assessments (Metsämuuronen & Nousiainen, 2021). According to the national assessment, some of the most recent decline in skills may be explained by the COVID-19 pandemic but, on the other hand, skills have actually been in decline since 2001. In our online studies it will be possible for students to reinforce their previously acquired skills in repetition paths, but it is clear that no amount of repetition paths can make up for major gaps in basic knowledge.

CONCLUSION
According to our results, students from different vocational fields entering vocational education regard online learning as a quite flexible way to study. They expect to be able to ask for advice from an online teacher through chat, but they don't expect an online course to be made like a game. Students feel that they need mathematics in their future career, but they do not want to study it more than the jobs in their future careers would require. Students do not desire to study mathematics in an on-the-job training place rather than in a classroom, and studying mathematics online is not considered to be a very attractive option. As a rule, students do not feel that they need help in studying mathematics, for example from their teachers or parents. However, in all of these situations there are significant differences between some vocational fields, and hence the differences between the various fields should be taken into account when planning online learning and mathematics education in vocational education.

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APPENDIX A

Views and expectations of students entering vocational education ($N = 824$) concerning online learning, means and standard deviations (1 = completely disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = largely agree, 5 = completely agree).

Claim		Humanities and Arts ($N = 128$)	Business, Administration and Law ($N = 120$)	Agriculture and Forestry ($N = 27$)	Service Industries ($N = 163$)	Technology($N = 175$)	Health and Welfare ($N = 179$)	Information and Communication Technologies ($N = 32$)
I would be happy to use a phone for my studies.	*M*	3.26	3.62	3.26	3.74	3.63	3.73	3.66
	S.D.	1.212	0.980	1.163	1.086	1.024	1.014	1.125
I want to use a computer a lot in my future studies.	*M*	3.65	3.93	3.00	3.66	3.46	3.65	4.62
	S.D.	1.240	0.842	1.209	1.050	0.945	0.913	0.554
Some of your studies will likely be independent online studies. Questions 42–48 relate to online learning. I would be happy to study online.	*M*	3.36	3.79	3.22	3.63	3.44	3.62	3.97
	S.D.	1.272	0.819	1.281	1.043	1.015	0.989	0.822
I believe online learning is a flexible way to study.	*M*	3.80	3.90	3.48	3.85	3.59	4.02	4.25
	S.D.	0.991	0.782	1.122	0.957	0.866	0.761	0.762
I want it to be possible in an online learning environment to ask for advice from an online teacher through chat.	*M*	4.01	3.83	3.63	3.90	3.62	4.13	4.00
	S.D.	0.926	0.895	0.884	0.914	0.861	0.828	0.803
I want to chat with other students in an online learning environment.	*M*	3.41	3.33	2.96	3.36	3.19	3.56	3.37
	S.D.	1.125	0.929	1.126	1.016	0.906	0.943	0.907
It would be nice if the online course had been made like a game.	*M*	2.88	3.16	2.96	3.15	3.06	3.21	3.44
	S.D.	1.296	0.953	1.055	1.118	0.954	1.110	1.190
I want the learning game or software to	*M*	3.79	3.66	3.33	3.57	3.39	3.80	3.59

give immediate feedback on my success.	S. D.	1.017	0.845	1.074	1.048	0.964	0.902	1.073
I find it important to see my progress in the learning game, for example, described using different levels (e.g., bronze, silver, gold).	M	3.34	3.50	3.26	3.49	3.27	3.60	3.53
	S. D.	1.173	0.889	1.059	0.952	0.961	1.025	1.016

APPENDIX B

Views and expectations of students entering vocational education ($N = 824$) concerning online learning, numbers and percentages of responses to "completely disagree" or "disagree" (A), "neither agree nor disagree" (B) and "largely agree" or "completely agree" (C).

Claim		Humanities and Arts ($N = 128$)	Business, Administration and Law ($N = 120$)	Agriculture and Forestry ($N = 27$)	Service Industries ($N = 163$)	Technology ($N = 175$)	Health and Welfare ($N = 179$)	Information and Communication Technologies ($N = 32$)
I would be happy to use a phone for my studies.	A	34 (26.6%)	11 (9.2%)	6 (22.2%)	22 (13.5%)	22 (12.6%)	23 (12.8%)	5 (15.6%)
	B	35 (27.3%)	44 (36.7%)	11 (40.7%)	35 (21.5%)	45 (25.7%)	38 (21.2%)	9 (28.1%)
	C	59 (46.1%)	65 (54.2%)	10 (37.0%)	106 (65.0%)	108 (61.7%)	118 (65.9%)	18 (56.3%)
I want to use a computer a lot in my future studies.	A	19 (14.8%)	6 (5.0%)	8 (29.6%)	19 (11.7%)	24 (13.7%)	19 (10.6%)	0 (0.0%)
	B	35 (27.3%)	26 (21.7%)	10 (37.0%)	46 (28.2%)	60 (34.3%)	53 (29.6%)	1 (3.1%)
	C	74 (57.8%)	88 (73.3%)	9 (33.3%)	98 (60.1%)	91 (52.0%)	107 (59.8%)	31 (96.9%)
Some of your studies will likely be independent online studies. Questions 42–48 relate to online learning. I would be happy to study online.	A	33 (25.8%)	4 (3.3%)	7 (25.9%)	21 (12.9%)	27 (15.4%)	22 (12.3%)	1 (3.1%)
	B	32 (25.0%)	43 (35.8%)	7 (25.9%)	46 (28.2%)	61 (34.9%)	50 (27.9%)	8 (25.0%)
	C	63 (49.2%)	73 (60.8%)	13 (48.1%)	96 (58.9%)	87 (49.7%)	107 (59.8%)	23 (71.9%)
I believe online learning is a flexible way to study.	A	11 (8.6%)	3 (2.5%)	4 (14.8%)	13 (8.0%)	13 (7.4%)	3 (1.7%)	0 (0.0%)
	B	33 (25.8%)	31 (25.8%)	9 (33.3%)	40 (24.5%)	62 (35.4%)	38 (21.2%)	6 (18.8%)
	C	84 (65.6%)	86 (71.7%)	14 (51.9%)	110 (67.5%)	100 (57.1%)	138 (77.1%)	26 (81.3%)

Claim								
I want it to be possible in an online learning environment to ask for advice from an online teacher through chat.	A	7 (5.5%)	6 (5.0%)	2 (7.4%)	6 (3.7%)	11 (6.3%)	7 (3.9%)	1 (3.1%)
	B	27 (21.1%)	36 (30.0%)	8 (29.6%)	44 (27.0%)	68 (38.9%)	27 (15.1%)	7 (21.9%)
	C	94 (73.4%)	78 (65.0%)	17 (63.0%)	113 (69.3%)	96 (54.9%)	145 (81.0%)	24 (75.0%)
I want to chat with other students in an online learning environment.	A	24 (18.8%)	19 (15.8%)	7 (25.9%)	24 (14.7%)	27 (15.4%)	20 (11.2%)	3 (9.4%)
	B	42 (32.8%)	52 (43.3%)	12 (44.4%)	65 (39.9%)	89 (50.9%)	61 (34.1%)	14 (43.8%)
	C	62 (48.4%)	49 (40.8%)	8 (29.6%)	74 (45.4%)	59 (33.7%)	98 (54.7%)	15 (46.9%)
It would be nice if the online course had been made like a game.	A	46 (35.9%)	22 (18.3%)	7 (25.9%)	40 (24.5%)	39 (22.3%)	40 (22.3%)	9 (28.1%)
	B	39 (30.5%)	60 (50.0%)	13 (48.1%)	62 (38.0%)	85 (48.6%)	66 (36.9%)	6 (18.8%)
	C	43 (33.6%)	38 (31.7%)	7 (25.9%)	61 (37.4%)	51 (29.1%)	73 (40.8%)	17 (53.1%)
I want a learning game or software to give immediate feedback on my success.	A	10 (7.8%)	9 (7.5%)	4 (14.8%)	19 (11.7%)	18 (10.3%)	11 (6.1%)	6 (18.8%)
	B	37 (28.9%)	37 (30.8%)	12 (44.4%)	55 (33.7%)	86 (49.1%)	55 (30.7%)	9 (28.1%)
	C	81 (63.3%)	74 (61.7%)	11 (40.7%)	89 (54.6%)	71 (40.6%)	113 (63.1%)	17 (53.1%)
I find it important to see my progress in a learning game, for example, described using different levels (e.g., bronze, silver, gold).	A	26 (20.3%)	10 (8.3%)	4 (14.8%)	19 (11.7%)	23 (13.1%)	21 (11.7%)	5 (15.6%)
	B	49 (38.3%)	50 (41.7%)	14 (51.9%)	61 (37.4%)	85 (48.6%)	57 (31.8%)	12 (37.5%)
	C	53 (41.4%)	60 (50.0%)	9 (33.3%)	83 (50.9%)	67 (38.3%)	101 (56.4%)	15 (46.9.%)

APPENDIX C

Views and expectations of students entering vocational education ($N = 824$) concerning online learning, pairwise comparisons using the Kruskal-Wallis test.

Claim	Pairwise comparisons using the Kruskal-Wallis test	
	Fields and their mean ranks	*p*-value (Adj. Sig.)
I would be happy to use a phone for my studies.	Humanities and Arts (346.38) - Health and Welfare (439.15)	0.009
	Humanities and Arts (346.38) - Service Industries (444.82)	0.005
	Agriculture and Forestry (279.56) - Business, Administration and Law (466.46)	0.002

I want to use a computer a lot in my future studies.	Agriculture and Forestry (279.56) - Information and Communication Technologies (639.84)	0.000
	Technology (360.22) - Business, Administration and Law (466.46)	0.002
	Technology (360.22) - Information and Communication Technologies (639.84)	0.000
	Health and Welfare (401.83) - Information and Communication Technologies (639.84)	0.000
	Service Industries (411.32) - Information and Communication Technologies (639.84)	0.000
	Humanities and Arts (421.02) - Information and Communication Technologies (639.84)	0.000
	Business, Administration and Law (466.46) - Information and Communication Technologies (639.84)	0.003
Some of your studies will likely be independent online studies. Questions 42–48 relate to online learning. I would be happy to study online.	There were no statistically significant pairwise comparisons (even though p = 0.011)	
I believe online learning is a flexible way to study.	Technology (347.67) - Health and Welfare (455.09)	0.000
	Technology (347.67) - Information and Communication Technologies (516.72)	0.002
I want it to be possible in an online learning environment to ask for advice from an online teacher through chat.	Technology (339.18) - Service Industries (415.59)	0.037
	Technology (339.18) - Humanities and Arts (446.22)	0.001
	Technology (339.18) - Health and Welfare (475.11)	0.000
	Business, Administration and Law (394.08) - Health and Welfare (475.11)	0.046
I want to chat with other students in an online learning environment.	Technology (369.56) - Health and Welfare (459.68)	0.004
It would be nice if the online course had been made like a game.	There were no statistically significant pairwise comparisons (p = 0.144)	
I want a learning game or software to give immediate feedback on my success.	Technology (353.53) - Health and Welfare (451.58)	0.001
	Technology (353.53) - Humanities and Arts (455.70)	0.002
I find it important to see my progress in a learning game, for example, described using different levels (e.g., bronze, silver, gold).	Technology (373.78) - Health and Welfare (451.64)	0.025

APPENDIX D

Number of respondents from the various fields in the various options of multiple choice question 43: "How would you like the online learning instructions to be told? You can choose several options."

Vocational field (frequency of respondents)	Frequency and percentage of respondents of the field for option			
	Using pictures	Read aloud	As a video guide	Verbal instructions would be sufficient
Agriculture and Forestry (*N* = 27)	8 (29.6%)	4 (14.8%)	8 (29.6%)	18 (66.7%)
Business, Administration and Law (*N* = 120)	44 (36.7%)	7 (5.8%)	40 (33.3%)	89 (74.2%)
Health and Welfare (*N* = 179)	95 (53.1%)	31 (17.3%)	79 (44.1%)	106 (59.2%)
Humanities and Arts (*N* = 128)	67 (52.3%)	17 (13.3%)	68 (53.1%)	83 (64.8%)
Information and Communication Technologies (*N* = 32)	10 (31.3%)	0 (0.0%)	10 (31.3%)	26 (81.3%)
Service Industries (*N* = 163)	79 (48.5%)	29 (17.8%)	51 (31.3%)	104 (63.8%)
Technology (*N* = 175)	82 (46.9%)	19 (10.9%)	64 (36.6%)	102 (58.3%)

APPENDIX E

Perceptions of students entering vocational education (*N* = 824) concerning studying mathematics, means and standard deviations (1 = completely disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = largely agree, 5 = completely agree).

Claim		Humanities and Arts (*N* = 128)	Business, Administration and Law (*N* = 120)	Agriculture and Forestry (*N* = 27)	Service Industries (*N* = 163)	Technology(*N* = 175)	Health and Welfare (*N* = 179)	Information and Communication Technologies (*N* = 32)
Questions 50–56 deal with the connection between mathematics and your future career and studying mathematics. I will need mathematics in my future career.	*M*	3.80	4.23	4.07	3.99	4.12	4.35	3.88
	S.D.	0.917	0.847	0.675	0.786	0.797	0.823	0.833
Mathematics is easy for me.	*M*	3.00	3.16	3.41	3.07	3.17	2.93	3.19
	S.D.	1.184	0.987	0.888	1.150	0.954	1.081	1.030
I want to study mathematics more than the jobs of my future career would require.	*M*	2.36	2.78	2.44	2.38	2.68	2.52	2.63
	S.D.	1.106	1.078	1.155	1.061	0.989	1.056	1.129
It is enough for me that the stories, examples and tasks involved in studying	*M*	3.03	3.13	3.11	3.03	3.07	2.84	3.31

mathematics are related to everyday life and work tasks in someone else's field, they do not have to be related to my own field.	*S.D.*	1.019	0.856	0.847	0.899	0.897	0.976	0.998
It is important that the mathematics taught in vocational training (stories, examples, and assignments) is closely related to the work assignments in my own field.	*M*	3.52	3.40	3.59	3.46	3.61	3.73	3.31
	S.D.	0.996	0.844	0.694	0.877	0.802	0.820	0.859
Studying mathematics online sounds like an interesting opportunity.	*M*	2.87	3.49	2.96	3.17	3.17	3.21	3.03
	S.D.	1.263	0.850	1.055	1.022	0.954	1.053	0.933
I want to study mathematics in an on-the-job training place rather than a classroom.	*M*	2.50	2.84	3.44	2.77	2.89	2.79	2.91
	S.D.	1.122	0.850	1.050	1.086	0.950	0.966	1.058
I need support in studying mathematics (e.g., from a teacher, a classmate, parents).	*M*	3.00	2.79	2.63	3.03	2.87	3.31	2.56
	S.D.	1.217	1.012	1.043	1.234	1.083	1.176	1.162

APPENDIX F

Perceptions of students entering vocational education ($N = 824$) concerning studying mathematics, numbers and percentages of responses to "completely disagree" or "disagree" (A), "neither agree nor disagree" (B) and "largely agree" or "completely agree" (C).

Claim		Humanities and Arts ($N = 128$)	Business, Administration and Law ($N = 120$)	Agriculture and Forestry ($N = 27$)	Service Industries ($N = 163$)	Technology($N = 175$)	Health and Welfare ($N = 179$)	Information and Communication Technologies ($N = 32$)
Questions 50–56 deal with the connection between mathematics and your future career and studying mathematics. I will need mathematics in my future career.	A	12 (9.4%)	2 (1.7%)	0 (0.0%)	4 (2.5%)	2 (1.1%)	4 (2.2%)	1 (3.1%)
	B	33 (25.8%)	23 (19.2%)	5 (18.5%)	33 (20.2%)	37 (21.1%)	25 (14.0%)	10 (31.3%)
	C	83 (64.8%)	95 (79.2%)	22 (81.5%)	126 (77.3%)	136 (77.7%)	150 (83.8%)	21 (65.6%)
Mathematics is easy for me.	A	46 (35.9%)	26 (21.7%)	3 (11.1%)	49 (30.1%)	36 (20.6%)	61 (34.1%)	6 (18.8%)

	B	31 (24.2%)	52 (43.3%)	14 (51.9%)	56 (34.4%)	72 (41.1%)	63 (35.2%)	13 (40.6%)
	C	51 (39.8%)	42 (35.0%)	10 (37.0%)	58 (35.6%)	67 (38.3%)	55 (30.7%)	13 (40.6%)
I want to study mathematics more than the jobs of my future career would require.	**A**	71 (55.5%)	43 (35.8%)	13 (48.1%)	89 (54.6%)	60 (34.3%)	94 (52.5%)	14 (43.8%)
	B	40 (31.3%)	51 (42.5%)	8 (29.6%)	53 (32.5%)	86 (49.1%)	53 (29.6%)	12 (37.5%)
	C	17 (13.3%)	26 (21.7%)	6 (22.2%)	21 (12.9%)	29 (16.6%)	32 (17.9%)	6 (18.8%)
It is enough for me that the stories, examples and tasks involved in studying mathematics are related to everyday life and work tasks in someone else's field, they do not have to be related to my own field.	**A**	35 (27.3%)	20 (16.7%)	4 (14.8%)	34 (20.9%)	30 (17.1%)	57 (31.8%)	4 (12.5%)
	B	53 (41.4%)	64 (53.3%)	17 (63.0%)	86 (52.8%)	94 (53.7%)	86 (48.0%)	16 (50.0%)
	C	40 (31.3%)	36 (30.0%)	6 (22.2%)	43 (26.4%)	51 (29.1%)	36 (20.1%)	12 (37.5%)
It is important that the mathematics taught in vocational training (stories, examples, and assignments) is closely related to the work assignments in my own field.	**A**	14 (10.9%)	13 (10.8%)	0 (0.0%)	17 (10.4%)	5 (2.9%)	8 (4.5%)	3 (9.4%)
	B	49 (38.3%)	58 (48.3%)	14 (51.9%)	67 (41.1%)	86 (49.1%)	55 (30.7%)	18 (56.3%)
	C	65 (50.8%)	49 (40.8%)	13 (48.1%)	79 (48.5%)	84 (48.0%)	116 (64.8%)	11 (34.4%)
Studying mathematics online sounds like an interesting opportunity.	**A**	44 (34.4%)	10 (8.3%)	7 (25.9%)	34 (20.9%)	33 (18.9%)	40 (22.3%)	7 (21.9%)
	B	37 (28.9%)	53 (44.2%)	10 (37.0%)	67 (41.1%)	81 (46.3%)	61 (34.1%)	17 (53.1%)
	C	47 (36.7%)	57 (47.5%)	10 (37.0%)	62 (38.0%)	61 (34.9%)	78 (43.6%)	8 (25.0%)
I want to study mathematics in an on-the-job training place rather than a classroom.	**A**	59 (46.1%)	39 (32.5%)	3 (11.1%)	63 (38.7%)	47 (26.9%)	62 (34.6%)	8 (25.0%)
	B	50 (39.1%)	61 (50.8%)	14 (51.9%)	59 (36.2%)	94 (53.7%)	80 (44.7%)	18 (56.3%)
	C	19 (14.8%)	20 (16.7%)	10 (37.0%)	41 (25.2%)	34 (19.4%)	37 (20.7%)	6 (18.8%)
I need support in studying mathematics (e.g., from a teacher, a classmate, parents).	**A**	41 (32.0%)	43 (35.8%)	12 (44.4%)	52 (31.9%)	57 (32.6%)	44 (24.6%)	15 (46.9%)
	B	45 (35.2%)	53 (44.2%)	10 (37.0%)	48 (29.4%)	76 (43.4%)	51 (28.5%)	11 (34.4%)
	C	42 (32.8%)	24 (20.0%)	5 (18.5%)	63 (38.7%)	42 (24.0%)	84 (46.9%)	6 (18.8%)

APPENDIX G

Perceptions of students entering vocational education ($N = 824$) concerning mathematics, pairwise comparisons using the Kruskal-Wallis test.

Claim	Pairwise comparisons using the Kruskal-Wallis test	
	Fields and their mean ranks	**p-value (Adj. Sig.)**
Questions 50–56 deal with the connection between mathematics and your future career and studying mathematics. I will need mathematics in my future career.	Humanities and Arts (337.57) - Business, Administration and Law (451.28)	0.001
	Humanities and Arts (337.57) - Health and Welfare (484.34)	0.000
	Information and Communication Technologies (347.80) - Health and Welfare (484.34)	0.030
	Service Industries (377.77) - Health and Welfare (484.34)	0.000
Mathematics is easy for me.	There were no statistically significant pairwise comparisons (p = 0.211)	
I want to study mathematics more than the jobs of my future career would require.	Humanities and Arts (370.19) - Business, Administration and Law (463.75)	0.027
	Service Industries (376.02) - Business, Administration and Law (463.75)	0.030
It is enough for me that the stories, examples and tasks involved in studying mathematics are related to everyday life and work tasks in someone else's field, they do not have to be related to my own field.	There were no statistically significant pairwise comparisons (even though p = 0.028)	
It is important that the mathematics taught in vocational training (stories, examples, and assignments) is closely related to the work assignments in my own field.	Business, Administration and Law (368.53) - Health and Welfare (466.49)	0.004
	Service Industries (392.91) - Health and Welfare (466.49)	0.047
Studying mathematics online sounds like an interesting opportunity.	Humanities and Arts (364.39) - Business, Administration and Law (477.11)	0.002
I want to study mathematics in an on-the-job training place rather than a classroom.	Humanities and Arts (348.63) - Technology (435.01)	0.020
	Humanities and Arts (348.63) - Agriculture and Forestry (544.13)	0.001
I need support in studying mathematics (e.g., from a teacher, a classmate, parents).	Information and Communication Technologies (328.59) - Health and Welfare (477.21)	0.016
	Business, Administration and Law (370.62) - Health and Welfare (477.21)	0.002
	Technology (388.01) - Health and Welfare (477.21)	0.006

ONLINE LEARNING AND ODL SYSTEM DURING COVID-19: SITUATING THE EXPERIENCES OF UNIVERSITY STUDENTS AND TEACHERS IN KASHMIR

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ABSTRACT
The Covid-19 pandemic badly hit the education sector with global calls for educational institutions to lockdown. The current study aimed to understand how Open and Distance Learning (ODL) responded to the Covid-19 pandemic in Kashmir valley and how students and teachers experienced the role of distance education in such crisis. In this qualitative study, 11 participants, including teachers and students of the Directorate of Distance Education, University of Kashmir, participated. A semi-structured questionnaire and document analysis methods were espoused for collection of data. The thematic analysis method was employed to interpret and analyze the data. This study demonstrated that the Directorate of Distance Education, University of Kashmir, played a key role in continuing higher education in Kashmir through digital and online spaces despite having limited access to high-speed internet. Furthermore, it was revealed that participants frequently used Google Meet, Google Form, Zoom, and WhatsApp during the Covid-19 pandemic because of their easy access and effective platforms for virtual learning. Non-seriousness, lack of interest, and lack of attention among participants were also found because they were not habitual in virtual teaching and learning during Covid-19.
Keywords: Covid-19, E-Learning, Kashmir, Open and Distance Learning, Pedagogical Practices

INTRODUCTION
Humankind has witnessed big disasters and pandemics across the ages. The present century has seen the outbreak of the Covid-19 pandemic originating in Wuhan city of China (Abuhammad, 2020). The inception of Covid-19 badly affected maximum social institutions, including education (Alvi & Gupta, 2020; Gewalt et al., 2022). However, among all the social institutions, education remained the most affected institution globally due to closure for a prolonged period (Abidah et al., 2020). This closure affected 1.7 billion learners globally; India is home to more than 32 crore learners, among which 34 million students are enrolled at higher education level (Jena, 2020a; UNESCO, 2020). Students and teachers were caught in a dilemma as they were disturbed and stressed to understand how to resolve this unexpected crisis (Jena, 2020b). Moreover, besides preplanned activities, it also destabilized the other educational activities, professional growth and development, evaluation, and assessment system (Singh et al., 2020). Online education emerged as a feasible alternative means for education to counter the consequences of the closure of educational institutions (Abidah et al., 2020; Aboagye et al., 2020). Therefore, role of online education for open and distance learners and teachers during Covid-19 need to be understood in the context of Kashmir which is still unexplored.

REVIEW OF LITERATURE
Online education is worthwhile at any moment and anywhere during upheaval periods like-man-made catastrophes, natural calamities, or pandemics like Covid-19 (Bergdahl & Nouri, 2020) because it maintains the continuity of education (Azmat & Ahmad, 2022). Online education emerges as a means to keep the education system running (Nikman e al., 2022). Like other countries, India also issued directives for the lockdown, and the

government advocated for continuing education through distance and online spaces (Babbar & Gupta, 2022). Zoom, Google Classroom, and Google Meet platforms were used frequently for this purpose (Alvi & Gupta, 2020; Lawrence & Preethi, 2021). In their study, Lall and Singh (2020) unpacked that students were optimistic about online education because of flexible learning possibilities. Li et al. (2014) also asserted that online education effectively ensures inclusiveness in less developed areas. However, the findings of different studies conducted by different researchers (e.g., Arora & Srinivasan, 2020; Gratz & Looney, 2020) revealed the various issues of virtual learning experienced by all stakeholders during Covid-19. The common issues experienced by teachers and students include internet gags, lack of technical knowledge, lack of interest, lack of gadgets, and lack of motivation. Various studies (e.g., Bower & Hardy, 2004; LaMonica, 2001; Oliver, 2003) demonstrated that online education demands a distinct pedagogy and a particular skill set from conventional teaching.

Open and Distance Learning (henceforth, ODL) maintains the durability of education (Bruder, 1989; Omiles et al., 2019; Shah & Sofal, 2011). It provides endless learning opportunities (Alharthi, 2020; Lou, 2004), and reduces educational expenses (Al-Husban, 2020) among learners despite being in different places (Weinhandl et al., 2020). Similarly, it is helping India to achieve its higher education goals, including raising the Gross Enrolment Ratio (GER), democratizing education, and making individuals job-oriented (Saumya & Singh, 2020). It is considered a positive breakthrough due to its versatile learning climate (Dietrich et al., 2020). Nonetheless, teachers and students experienced many opportunities and challenges in general and students and teachers at the ODL system at the tertiary level in particular because of the pandemic (Jena, 2020a, 2020b). Among the various challenges, students missed in-person contact cum counseling classes, found time management difficulties, and lack of quality control. Teachers struggle in adopting online gadgets for teaching, stuck in low speed and or no internet connectivity, confusion related to admission in new courses, confusion related to the internal practice of teaching and internship for B.Ed candidates remain major challenges for the ODL system (Jena, 2020a, 2020b).

Nevertheless, in the ODL system, teachers and students interact beyond the boundaries of the educational institute via technical and electronic means, so that knowledge from its sources reaches the students (Lassoued et al., 2020). Distance education gave birth to e-learning (Holmberg et al., 2005). In the ODL system, teaching materials are shared through different internet services so that teachers and students can communicate with each other (Jena, 2020b). In their study, Liguori and Winkler (2020) showed that ODL counseling classes are held for different courses through different video conferencing platforms, including Zoom and Google Meet. Jena (2020b), in his study on Indira Gandhi National Open University (IGNOU), also unveiled that due to the Covid-19 pandemic, learners of IGNOU are taking more interest in pursuing their learning through ODL. It was also shown that IGNOU resolved many grievances relevant to admission through different virtual platforms. Similarly, Jena (2020b) revealed that Covid-19 provided several options for the ODL system, including the admission process conducted online, the counseling process conducted online, and the online submission of assignments. Therefore, the role of technology was vital in the ODL system during Covid-19 period

RATIONALE OF THE STUDY
In the context of Kashmir, which is known worldwide as paradise on earth (Mir, 2014; Sharma, 2008), has seen unrest and turmoil for decades (Bhat, 2019; Bose, 2003). This turmoil affected all dimensions of life in Kashmir, but education was mostly affected (Amin, 2020; Khan & Hamid, 2021; Khan et al., 2022; Shah, 2016; Shah & Mishra, 2020). Moreover, the Covid-19 pandemic further worsened the education scenario in Kashmir (Shoib & Arafat, 2020) by closing all formal spaces of learning (Wani et al., 2022). Thus, Covid-19 hampered the progress of students academically. In such situations, a broken education system in Kashmir can be fixed with technology and the ODL system by adopting the philosophy of thinkers like Ivan Illich (Teräs et al., 2020). Thus, this study aimed to explore the amalgamation of technology and the ODL system during the Covid-19 crisis with special reference to the Directorate of Distance Education, University of Kashmir (DDE, KU). While reviewing the literature, it was observed that no study had been conducted to explore the influence of Covid-19 on the ODL system in Kashmir. Thus, this study is substantial in adding to relevant literature as it involves students and teachers lived experiences.

Objectives of the Study:
➢ To explore the experiences of ODL teachers and students about the online teaching-learning process during the Covid-19 pandemic in Kashmir valley.
➢ To understand the role of the Directorate of Distance Education, University of Kashmir, in promoting online learning during Covid-19.

METHODOLOGY
Research Approach and Design
This research was grounded in the qualitative approach with phenomenological design to reconnoiter the lived

experiences of ODL teachers and students in adopting e-learning amid the Covid-19. The purpose of phenomenology, according to Tuffour (2017) and Van Manen (2016), is to articulate the significance of experience from the perspective of the experience both in terms of "what" and "how." Researchers took the insight from the literature (e.g., Islam et al., 2021) and decided that this approach was most appropriate for investigating the study's objectives.

Participants and Procedure

The researchers in the present study used purposive sampling technique to choose the participants. The researchers only approached those persons who, in their judgment, were most likely to have lived experiences about ODL and were ready to provide it. Thus, the DDE teachers and students were approached for this study because the purpose of DDE is to impart education in various disciplines through ODL mode. The Directorate is situated within the University of Kashmir campus in the district of Srinagar, Jammu and Kashmir, India. The participants from DDE recruited for this study were 11, including three teachers and eight students. Creswell (2007) stressed that a sample size of 10 can be considered enough since the quality, not the quantity, is the most significant factor in qualitative research. The demographic profile of participants is presented in Table 1.

Table 1. Demographic Profile of Participants (N- 11)

S. No.	Gender	Age	Residence	Course/ Designation*
1.	Male	24	Rural	B. Ed.
2.	Male	27	Rural	Master's in English
3.	Male	28	Urban	Master's in Urdu
4.	Male	27	Rural	Master's in Education
5.	Female	22	Urban	B. Ed.
6.	Female	24	Urban	B. Ed.
7.	Female	26	Rural	Master's in Commerce
8.	Female	25	Urban	Master's in English
9.	Male*	38	Rural	Assistant Professor *
10.	Male *	40	Urban	Assistant Professor*
11.	Male *	37	Urban	Assistant Professor*

Note: asterisk (*) marks are the faculty members at DDE, KU

Participants were recruited through the following inclusion criteria (1) students enrolled and teachers working in the Directorate of Distance Education, University of Kashmir, (2) students currently pursuing a Master's or B.Ed. degree, (3) residents of the Kashmir region, and (4) willing to participate in the study. Researchers discussed the purpose and objectives of the study with all the participants and took consent from them. All the participants were assured of their anonymity. A semi-structured questionnaire with open-ended questions was prepared for data collection and sent to participants through Email and Whatsapp for their convenience. Various qualitative studies (e.g., Castroverde & Acala, 2021; Popa et al., 2020) also adopted semi-structured questionnaires to get the responses from participants. Data was collected between December 2020 and March 2021. Document analysis was also conducted by reviewing and evaluating the documents by visiting the website of the Directorate. As a way of triangulation, "it is frequently used in conjunction with other qualitative research methods-'the combination of methodologies in the study of the same phenomenon" (Denzin, 1970, p. 291). Directorate had put maximum official notifications about examinations, admission process, online classes, and e-material on its website during the Covid-19 pandemic.

Data Analysis

Thematic analysis method was used for the analysis of obtained data. As thematic analysis had been used by many researchers (Sundler et al., 2019) to understand people's lived experiences. The authors examined the data thoroughly through the open coding process in which "you work intensively with your data, line by line, identifying themes and categories that seem of interest" (Esterberg, 2002, p. 158).

RESULTS

Five themes emerged through the analytic procedure, describing the participants' experiences in the thematic map (Figure 1). To ensure the anonymity of participants, researchers used numbers instead of names in verbatim.

Figure 1. Five themes identified in the analysis depicted in the thematic map.
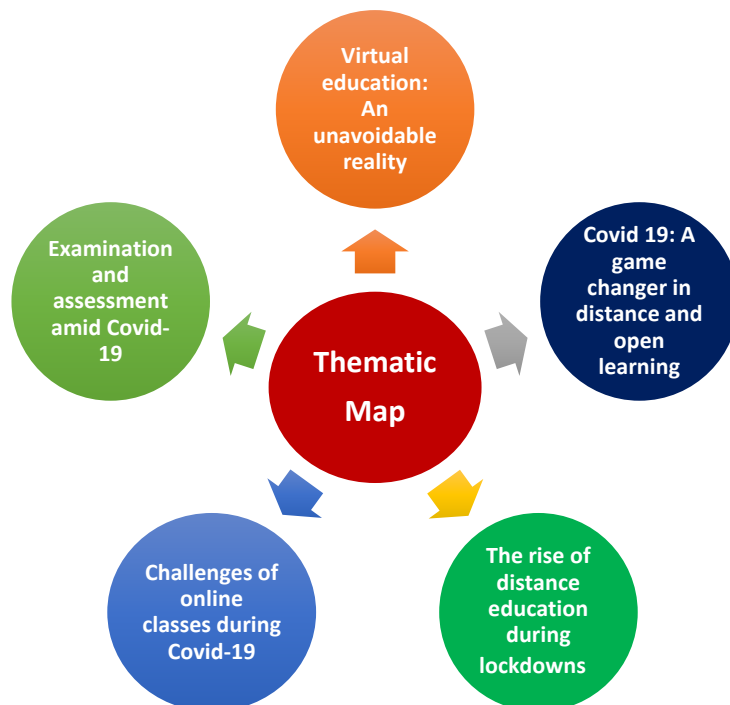
Virtual Education: An Unavoidable Reality

This study found that some teachers and students had experienced virtual mode difficult because they were not accustomed to online pedagogical practices. However, within the stipulated time, it was found that some teachers responded to the shift positively and found it useful and unavoidable mean. Likewise, maximum teachers and students demonstrated that they became techno-friendly, particularly with pedagogical platforms like Zoom, Google Meet, and Google Classroom. In the words of a teacher participant (9):

> *"Online learning is an important mode as it keeps track of continuing the education, particularly during Covid-19."*

One student participant (4) articulated:

> *"During Covid-19, I felt online education mode a positive and helpful means as it remained only an unavoidable means which can save our educational carrier during this deadly pandemic."*

Additionally, most students and teachers became well versed in due course of time in managing all their technical operations to make e-learning productive. It was analyzed that some teachers and students took more interest in virtual teaching-learning as it was found convenient for them in terms of space and time. One teacher participant (10) opined:

> *"Online mode enhanced the newest ways of digital learning and made me a techno-friendly learner . . . it is now a social reality as future belongs to artificial intelligence and machine learning."*

This study found that teachers became techno-friendly and managed to change their pedagogical practices. Some teachers had already attended training courses related to Massive Open Online Courses (MOOCs) much before this pandemic which helped them to manage all things efficiently in the online mode. Google Meet, Zoom, and WhatsApp were found frequently used platforms during the Covid-19 pandemic because of their free and easy access by students and teachers in the DDE. Moreover, it was unveiled that most of the teachers uploaded their PowerPoint presentations and e-tutorials before the conduct of their online classes.

Covid 19: A Game Changer in Distance and Open Learning

Some teachers reported that the DDE contributes unboundedly to society in the form of non-formal education. Likewise, during the Covid-19 times, it was observed that it had played an ineluctable part in the higher education of Jammu and Kashmir. Some teacher participants reported that Directorate had reached the unreached population by offering learners an opportunity to have access to higher education during the pandemic. It catered to the academic needs of thousands of their candidates during Covid-19. It was analyzed through document analysis that DDE shifted its pedagogical practices from offline mode to online mode for their contact cum counseling classes of its various courses very smoothly and provided e-material as well. One student participant (3) reported:

> *"I do not think DDE got affected by Covid-19 due to the professional commitment shown by faculty members."*

One teacher participant (9) narrated:

> *"DDE adopted diverse online platforms like- Google Meet, Google Form, Zoom, and WhatsApp to sustain the teaching-learning process."*

Through document analysis by visiting the DDE website, it was found that DDE had managed all the challenges due to Covid-19. It had carried out all its major activities like the admission process, teaching-learning process, and examination process of different courses like - B.Ed., P.G. programs (M.A/M.Sc./M.Com), and P.G. Diplomas in a sophisticated and systematic manner. To complete the admission process, it was demonstrated that students did all the formalities online while at home, including submitting their fees. Moreover, it was reported that the DDE made their Internal Practice of Teaching (IPOT) and Internship of B.Ed. candidates possible through the home-based online mode. For that, students had clearly instructed via YouTube videos found on the DDE website and on their YouTube channel. One student participant (6) articulated:

> *"The procedure of IPOT and internship available on YouTube cleared all my confusion. As sir has clearly explained everything about IPOT and internship via YouTube tutorials."*

One teacher participant (11) reported:

> *"We have uploaded videos on our YouTube channel about IPOT and internship so that students will not face any inconvenience in understanding the philosophy of IPOT and internship."*

Some student participants unveiled that DDE made their digital help desk functional for any academic grievance of their students enrolled in DDE. Similarly, numerous grievances were redressed, and many queries of students were resolved. However, some teacher participants suggested that Directorate needed to organize refresher courses, orientation programs, and workshops on virtual teaching-learning for both students and teachers. It was because, during any upheaval times like Covid-19, students and teachers need not face the challenge of switching over a virtual platform.

The Rise of Distance Education during Lockdowns

This study found that the socio-political context of Kashmir was demanding flexibility and openness in educational practices. However, the advantages of online learning developed a firm belief among the participants that online pedagogical practices have significant relevance in the future. It was because Kashmir remained under lockdown most of the time due to socio-political issues. Thus, Directorate remained a viable source to continue higher education in Kashmir. One teacher participant (10) articulated:

> *"Distance education has always remained an effective choice for higher education in Kashmir despite being politically* disturbed.*"*

On average, student participants reported that after the constitutional amendment in 2019, they suffered a lot academically due to internet gags. However, after the Covid-19 pandemic outbreak, students had no internet facility for some time. Nevertheless, when it was resumed, that was very low in speed (2G) which hampered their online education process. One student participant (2) expressed his feelings in the below excerpt:

> *"I felt helpless to remain connected continuously because of the poor network and did not continue online classes and even sometimes failed to appear in online examinations at the stipulated time."*

Some student participants demonstrated that the philosophy of distance education remained most relevant for geographically different places like Kashmir and crises like the Covid-19 pandemic. Therefore, ODL is more relevant during upheaval times in Kashmir.

Challenges of Online Classes during Covid-19

Lack of techno-training and weak networks remained barriers that the researchers analyzed frequently. It was found that most students were non-serious, uninterested, and inattentive because they were not habitual to online

teaching and learning, which proved a major academic obstacle for them. One student participant (7) narrated:

> *"I am not interested in virtual classes as it is without joy, enthusiasm, and competition. I think it is just a waste of time . . . It is also stressful to look at the phone or computer screen all day long."*

Moreover, it was found that the compulsion to appearing virtual classes and get full concentration were major issues among the maximum student participants. Furthermore, some of the students remained present virtually, but they were busy with other work was another form of bunking. One student participant (5) said:

> *"I joined the online classes but was not intact with a screen to listen to the lectures; instead, I left the phone frequently in my room and went to do my home chorus."*

Some teachers were found failed to create their learning atmosphere that they used to create in their in-person classrooms. Moreover, it was reported that harmonious development among students was impossible to develop in online learning. Thus, online learning can be the best alternative but cannot replace in-person interaction at any cost. One teacher participant (11) opined:

> *"Online mode of learning does not fulfill the desired things completely which learners used to have in face-to-face teaching and learning process as it is unable to develop all the domains (cognitive, psychomotor, and affective) of learners."*

Additionally, most student participants found that they maximum times did not get a chance to pose their questions to clear their confusion. Moreover, it was revealed that some teachers joined the classes at their convenience without knowing their students' interests, convenience and readiness and left the class at their own will at any time. It was further unearthed that education reached almost every learner but could not fulfill their educational aspirations, particularly the students with special educational needs. They got marginalized and remained excluded from the virtual learning culture during Covid-19. Thus, Covid-19 exposed the marginalized section to the hidden layers of the education system.

Examination and Assessment amid Covid-19

This study revealed a lack of seriousness, discipline, and proper surveillance in online examinations, which diminished the competitiveness among the student participants. Google Forms were used to take examinations without proper identification of the examinee. Few participants reported that these Google Forms were submitted by well-wishers of students who were experts in the same subject area. All the online examinations were taken in a multiple choice framework which lessened the real essence of academic examinations because such types of examinations failed to evaluate the creativity and writing skills of the students. One of the participants (5) narrated:

> *"Online examination is not a good choice due to lack of disciple, ethics, and surveillance. Most of the fellows were assisted by their well-wishers to get good grades and ranks in the examinations."*

One student participant (7) said:

> *"Online examination has become an exhibition which lacks surveillance. There is no threat of copying."*

The lack of advanced technology found a technical problem in the surveillance of the examination domain in the DDE. Therefore, the question of academic examination and evaluation of students remained a contested terrain in the ODL system during Covid-19.

DISCUSSION

The teaching-learning process has changed because of Covid-19 (Basilaia et al., 2020; Dhawan, 2020; Kumaran & Periakaruppan, 2022). Due to this paradigm shift, distance learning has proved the best remedy to overcome the difficulties of teachers, and students. Hence, the aim of this study is to understand the experiences of students and teachers of the DDE, KU, amid the Covid-19 pandemic. To this end, teachers' online pedagogical and the ICT competence, during online classes and online examinations, and students' experiences with virtual education were analyzed. The results of this study are both contradictory and parallel with the existing literature.

First, teachers and students have responded positively to the pedagogical shift and find it useful and unavoidable amid Covid-19. It has similar results to previous studies (Aristovnik et al., 2020; Jena, 2020b; Mishra et al., 2020) about the tertiary stage students who have experienced distance education as a viable alternative to lessen the influence of Covid-19 on education. This finding is further substantiated by the studies like (Abidah et al., 2020; Aboagye et al., 2020), who have reported that distance education has brought relief among students and teachers as a suitable alternative to continuing education. Moreover, Collins (2010) has also reported that most students are satisfied with distance education. Further, this study has shown that teachers and students are now more interested in virtual learning as it is convenient regarding space and time. This finding is authenticated by (Arora & Srinivasan, 2020; Saha et al., 2022), who have stated that distance education is most feasible because of its

accessibility, affordability, and flexibility. However, this finding contradicts the results of Favale et al. (2020), who argue that accessibility, affordability, and flexibility of distance education are precarious and create friction. These findings suggest that teachers and students are bound to adopt distance education as an alternative medium to make their teaching-learning process continue. E-learning is no longer a choice; it has become the air each institution must breathe to live (Serovaiskaia & Serovaiskii, 2022). Thinkers like Ivan Illich have predicted much before that future will be on learning webs like online education (Shah, 2015).

Participants have used Google Meet, Zoom, Google, and Whatsapp frequently amid the pandemic because of their free, easy access, and effective platforms for the online-teaching learning process. A similar result has been found in the current literature (Aristovnik et al., 2020; Basilaia et al., 2020; Dhawan, 2020), where it has been shown that these platforms have made it easier for students and teachers to communicate (Basilaia et al., 2020; Kumaran & Periakaruppan, 2022). This study also revealed non-seriousness, lack of interest, and lack of attention among participants because they were not habitual to online teaching and learning (Nikman e al., 2022). For example, Dhawan (2020) has stated that virtual education is boring, unengaging, and devoid of personal attention. Parkes et al. (2014) study found students underprepared for different e-learning and academic-based competencies. So, in this context, online classes have remained a compulsion where students have to remain virtually present in the classroom, but physically they have remained engaged in some other different activities. During Covid-19, a lack of experience and motivation to use technology in education has exacerbated the situation.

Education is meant for harmonious development, but in this study, it was found that harmonious development is impossible in virtual education. It can be the best alternative but cannot replace in-person interaction at any cost. This finding is analogous to the study of Collinson (2001) and Dhawan (2020), who asserts that online education cannot replace the teacher because virtual education is unable to address socio-emotional issues such as conflict and rage, socioeconomic disparities, estranged teenagers, uninspired students, and inappropriate behavior. Furthermore, the findings of this study have given an insight that the DDE grounded on the philosophy of ODL is more relevant during crises like Covid-19. It is because ODL has emerged as a promising alternative amid Covid-19 (Abidah et al., 2020; Aboagye et al., 2020). It intensified their efforts to incorporate ICT into their education system (Volungevičienė et al., 2020). Students have also shown a favorable experience towards ODL (Jena, 2020a, 2020b; Lawrence & Preethi, 2021; Saumya & Singh, 2020). This study has further unearthed that COVID-19 turned the challenges of DDE into opportunities and carried all its major activities like the admission process, teaching-learning process, and examination process of different courses in a sophisticated and systematic manner. This finding parallels the study by Jena (2020a, 2020b) on Indira Gandhi National Open University (IGNOU).

Furthermore, this study has shown that technology is not the solution for all. Online education has shown unfavorable experiences from students' and teachers' perspectives regarding motivation and interest in examinations. Online examination is just an exhibition, lacks seriousness and discipline, and is unproctored, which diminishes the competitiveness among the learners (Arnold, 2016; Bhat & Ahmad, 2020). In Kashmir, participants have experienced severe academic challenges due to continued internet limitations and during the Covid-19 lockdown. Thus, DDE during the Covid-19 like situation has proved an appropriate mode of education to keep the teaching-learning processes alive.

CONCLUSION
Covid-19 has helped the Directorate to explore virtual spaces of learning. Various free and easily accessible technological platforms, including Zoom, Google Meet, Google Classroom, and Google Forms, have been used by DDE, KU to impart education during the Covid-19 times like other distance education institutions of the world. All participants of this study have faced low-speed internet and other technical glitches during the entire virtual teaching-learning process. Despite all these obstacles and problems, Directorate has played a vital role in imparting higher education in the valley during the Covid pandemic. Besides this, ODL seems the most appropriate mode of education to keep the teaching-learning processes alive in geographically different places like Kashmir. The main limitation of this study is that it is delimited to DDE, KU only, so the generalization of findings to other educational institutions shall be made with more care. More like studies should be followed up in the future where researchers should go with maximum resources (multiple distance institutions and a big sample) to reflect more insights and understanding regarding distance education amid the pandemic. Overall this study proved that distance learning never stops, and situations like Covid-19 have demonstrated that the future belongs to Open and Distance Learning.

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ONLINE LEARNING DURING COVID-19: A BOON OR BANE?

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ABSTRACT:
Education is one of the major areas struck by the pandemic, disrupting the physical presence of the students and faculties in a formal space. This study aims to study the challenges and opportunities in Online learning during the Covid 19 pandemic among fifty high school and higher secondary school students from the Malappuram District of Kerala State. The current research aims to investigate the challenges and strategies implemented to overcome those challenges and the available opportunities in online learning. The study revealed that there is no association between demographic variables and the challenges of online learning. The results indicate that various strategies adopted for online learning have no association with the level of satisfaction in learning among the students, but peer learning is one of the most satisfaction deriving strategies to overcome the challenges of online learning. Garret's ranking technique identified that the major issue encountered during online learning is the delay in the delivery of information as a result of low internet signal strength. Successful students access the internet as an easy way to get learning input and not an easy way out.
Keywords: Online Learning, Pandemic, COVID 19, Challenges, Opportunities.

Introduction:
Online learning and digital classrooms are increasingly becoming a part of the global education system. When it comes to the Indian education system, the face-to-face classroom approach has always been the most popular method of imparting knowledge. The Right of Children to Free and Compulsory Education Act, also known as the Right to Education Act (RTE), is an Act of the Indian Parliament passed on August 4, 2009, that specifies the principles of free and compulsory primary education for children aged 6 to 14 in India. Learning is indispensable for all children and can be done in either a real or virtual environment. The education system around the world has recently undergone significant change as a result of the COVID-19 pandemic. This pandemic situation has directly affected every sector of people's lives, forcing all entities to shift to online channels and has also forced the physical closure of companies, schools, and sporting events all over the world. Online learning is defined as learning that takes place by the means of the internet and associated technology. In the current scenario, it is critical to gain an in-depth knowledge of students' experience with online learning during the covid-19 pandemic. The objective of the research is to determine the difficulties that students face when learning online. This study concentrated on students who took part in online learning and the challenges and opportunities connected with this learning process during the pandemic. There will be a radical shift in the post-covid-19 that will influence all establishments, especially those in the academic sector, throughout the world. This shift requires good leaders by bringing in proper recommendations for restructuring the prospect of education. Starting with education, healthcare sectors, sports, and allied fields, higher education plays a critical role in economic growth. As a result, the study attempts to comprehend the difficulties and possibilities of online learning in the present scenario.

Review Of Literature:
Azmil Hasan, and Muhammad Darwis (2021), primarily focused on their research into the obstacles and possibilities for online learning during the covid-19 outbreak. Using the randomized targeting method, this paper establishes a combination of challenges and opportunities. All data was gathered from students and teachers who offer a realistic view of their perception. Based on the findings, there are several issues and possibilities for online education during the pandemic. Ho Nhut Quang, Ha Minh Tri. (2021), investigated the challenges and prospects of online learning during the Covid-19 pandemic in their review paper. The analysis revealed a few difficulties and opportunities for e-learning. The study's objective was to pinpoint the obstacles and possibilities for online learning during Covid-19. In light of the observations, everyone should be cognizant of the various obstacles and opportunities for learning online in order to adapt to the circumstances. Abdelsalam M.Matuk et.al (2021), concentrated on their study of e-learning and the covid-19 epidemic, which provides both difficulties and possibilities for both faculty and students. The study also explored issues related to the application of online

learning and provided the upsides and downsides of e-learning methodologies. It is concluded that when comparing traditional education to online learning, there are a few challenges faced by online learning. Jessie S. Barrot (2021), drafted a paper on students' online learning challenges during the covid-19 pandemic outbreak. This study pointed out the various obstacles of web-based learning and revealed that covid-19 has influenced all institutions to learn online. The research also includes established strategies for overcoming various online learning challenges. Students confront a number of difficulties when learning online. The ability to learn and teach technology is determined to be the most difficult challenge.

Yustinus Budi Hermanto, and Vernika Agustini Srimulyani (2021), According to research, using an online learning system at home seems to be conceivable. The information is gathered from lower-level students to university students. Further research is being conducted to determine the positives and negatives of web-based learning during the covid-19 disease outbreak. T. Muthuprasad et.al: (2021), have published a review paper on online learning and the research examined university students' attitudes and enthusiasm for online education during the pandemic. The education was done digitally during the Covid-19 pandemic, and as a consequence of this students accepted this method of learning. The study prioritized students' positive perceptions of online learning. Upadhyay HP, et.al (2021), focuses on the learning environment of university students during the covid-19. Although this study prioritizes students' attitudes toward physical learning, research has made students of the University of Nepal graduate students. It provides a very interesting analysis that some students have a positive view of this study but others are not satisfied with it. Although the authors claim that reading online is better for theory than practical lessons.

Drs. Kuldeep Singh (2021), in the research paper, examined high school students' attitudes toward online learning and investigated the impact of gender and location on students' attitudes toward online learning. The dependency variation in this instance is the attitude toward online learning and differences independent of sexual identity and place. This study employs mathematical strategies such as definition, standard deviation, and t-tests. Where the key is an attitude toward online learning and different independent gender and location, established relationships are important. Sujata Khhobragade et.al: (2021), attempted to comprehend visual methods of learning during the Covid-19 pandemic in their research paper. It provides an excellent analysis of the barriers to online learning and provides solutions for overcoming these visual learning barriers. This study focuses on medical students who have visual learning barriers and offers a solution based on the notion that comprehension of these barriers is the only way to better prepare for future challenges. Gul Ozudogru (2021), research related to distance education which is found to be a problem during the covid-19 pandemic. The data was collected from pre-service teachers during the covid-19 outbreak and examined whether the diagnostic problems were the precursors of the solutions. It identifies the problems teachers face before this remote learning. Adarsh Garg (2021), the research paper is concerned with students' perceptions of online education during the pandemic. In this study, 2895 students were chosen as the sample and identified that in the pandemic situation online learning is considered as the best learning tool.

Mohammad Mahyoob (2020), in his research paper, investigated the difficulties students face during the Covid-19 pandemic. The concept and potency of online learning are identified through the research and the researcher stated that there are various challenges associated with online learning that highlight its effectiveness. It has been determined that online learning does not provide the expected development, and many of them are dissatisfied with the prospect of continuing to study online. Deepika Nambiar (2020), has written an online reading review article to better comprehend the effects of digital learning. The study's purpose was to learn about the views of college and university teachers and students toward online learning during the pandemic. It was concluded that there are a few areas that are critical for student and teacher satisfaction in order to continue learning online. Amir et al. (2020), Reviewed about students' perceptions of class and distance learning during the Covid-19. From the perspective of students, the study prioritized comparisons between classroom learning and distance learning and research revealed significant problems that students experience in overcoming the difficulties that require them to discover new learning methods. Distance learning, in comparison, has been found to be rather more efficacious than online reading. B. Doric et.al: (2020), compiled a study on students' perceptions of online learning during the pandemic and discovered the pros and cons of online learning. Although research has shown a positive attitude toward students by teaching online, there are a few issues with this type of learning.

Mohammad S Shawaqfeh et al: (2020), the study focuses primarily on pharmacy students who used online learning systems during the covid-19 pandemic. Although there are a few barriers to online learning, the study's main purpose was to evaluate students' perceptions of this type of learning and the students also expressed a desire for online learning. Muhammad & Kainat (2020), centered on the sociological standpoint on online learning in the backdrop of the Covid-19 pandemic and emphasized the problems with online learning. According to the findings of this study, online learning may not generate the expected outcomes in Pakistan, and the primary problem students face is having access to the internet. Neetha Devan NV (2020), designed a research paper that serves as a

model for students' perspectives on online learning. The study examined the effects and potency of online learning among students in Ernakulam district Kerala. The findings illustrate the challenges students face in learning online. Shivangi Dhawan (2020), the study concentrated on the significance of online learning during the pandemic and conducted a SWOC analysis of e-learning methods. This research provides insight into Edtech's growth in the aftermath of pandemics and natural catastrophes. The study addresses issues related to online learning and paints a clear picture of potential solutions. The findings emphasize the advantages, downsides, possibilities, and difficulties, as well as recommendations for overcoming various online learning challenges. Preethi Edison Daris (2020), focuses on the efficacy of online teaching methods in the classroom. Even though this study suggests that online reading tends to work well in terms of offering a wide range of information about the educational process. Online classes work well because they offer an accurate portrayal of facts and statistics whilst also saving time.

Objectives:
To identify the challenges faced by students through online learning.
To study the effectiveness and opportunities of online learning during covid-19.
To identify the strategies to overcome different online learning challenges.

Hypotheses:
H1: There exists a relationship between the age of the respondent and the challenges of online learning.
H2: There is a significant relationship between the gender of the respondent and the challenges of online learning.
H3: There is a significant relationship between strategies adopted to overcome different online learning challenges and the level of satisfaction with online learning.

Scope of the study:
This study covers online learning among school students, students of high school and higher secondary in the Malappuram district of Kerala are taken into consideration. The purpose of the study is to determine the challenges faced by students through online learning, to understand the potency and possibilities of online learning during the covid-19 pandemic, and identify the strategies to overcome different online learning challenges. The study is limited to the possibilities and challenges of online learning during covid-19. The purposive sampling technique is adopted to collect data for the study. The total number of samples taken for this study was 50 students from the Malappuram district.

Theoretical Framework:
Learning
"Learning is the acquisition of new behaviour or the strengthening or weakening of old behaviour as a result of experience"
          : Henry Smith

Online Learning
Online learning is an education that takes place online. It is often referred to as e-learning. Online learning is just a form of distance learning that takes place far away and not in a traditional classroom.

COVID-19
Coronavirus (covid-19) is an infectious disease caused by the SARS-CoV-2 virus that was first reported in 2019 in Wuhan, China. When an infected person coughs, sneezes, talks, or breathes, the virus can spread from their mouth or nose to tiny fluid-filled droplets. The most effective way to prevent and reduce the spread of the infection is to discover more about the disease and understand how the virus spreads. Stay at least one meter away from others, wear a well-fitting mask, and wash one's hands frequently to protect oneself and others from infection. Get vaccinated and follow local guidelines.

Challenges of Learning Online
1. Technical Problems
Technical problems are considered a major challenge for online learning that students face on social media. Sometimes students may face such difficulties because of a lack of knowledge. They may not know about technology such as how to get in, how to create and submit work, and how to communicate with teachers and friends. This problem requires technical support to fix, which causes constant disruption to the learning flow.

2. Distraction Issues at Home
Learning online is said to be challenging and creates distractions in terms of standard classroom learning. The student distractions include problems at home - with family members, roommates, friends, pets, or a neighbor.

Some of the distractions like TV, instant messaging, and social media can hinder a person from the work being done and reduce attention during an online class.

3. Causes Health Problems
Excessive use of online learning can cause health problems such as eye problems and headaches. Spending too much time in front of a screen can increase eye pressure and can cause a serious headache.

4. Lack of In-Person Interaction
The COVID-19 pandemic has compelled traditional classroom learning to online learning and consequently reduced interaction between students and teachers.

5. Lack of Electricity
Without electricity, it will be difficult for the students to study online, and cannot engage in academic activities or connect to the internet. Sometimes power supply plays an important role in online learning due to the long-term disruption. Power interruptions affect online classes are not capable of accessing online resources such as videos and classes in their online classrooms as necessary.

Opportunities for Learning Online
1. Strengthen Skills
   Online courses are designed to empower students to learn technical and non-technical skills. These skills will boost student confidence.
2. Mobile Learning
   Studying online using a personal mobile phone such as a smartphone, or tablet is considered mobile learning. It is flexible because it allows students to get an education anywhere anytime online. Most students have access to e-learning via mobile phones as it is portable.
3. New Courses
   Today, there are a variety of courses offered in online mode. The most popular online learning courses are related to Information Technology but, in the future, the need for different online courses may grow in unexpected courses.
4. Scope for Innovation
   New educational innovations encourage students to explore research and help students develop their skills to discover new things. It incorporates various aspects of problem-solving and improves problem-solving ability. So, there is a range to turn to learn into what it should be.
5. Increased Quality of Interaction
   Interaction is important in online learning as this allows students to share their ideas, and get to know about different aspects from other's points of view. Social interaction in online learning will help improve student performance.

The advantages of learning online:
• Learning online is easy and offers flexibility.
• Builds confidence among learners.
• Interaction session or student engagement
• Reduced costs
• Teach self-control.
• Learning online brings the comfort of education to home
• Easy presence compared to classroom learning.
• Ability to work full-time at home while studying classes.

The disadvantages of learning online
• No actual session for practicals.
• Not suitable for the whole topic
• It requires self-discipline.
• Lack of trust between the students and teachers
• It requires good time management skills.
• Spending too much time in front of a screen creates health problems.
• Technical difficulties
• Lack of technical knowledge
• Lack of problem-solving skills.

Strategies to Overcome the Challenges of Online Learning

➢ Self-study

Self-study is a great way to improve the learning experience. Self-study can be seen as a form of learning where students learn at their own pace, outside the classroom, without direct supervision. Self-study does not involve interpersonal communication and is very suitable for people who choose to take their time and do it for themselves.

➢ Resource management and utilization

In order to achieve the goals of online learning, it is necessary to manage the use of resources effectively. Therefore, we must consider essential resources such as human resources, learning resources, financial resources, and physical resources. And these resources must be properly managed to achieve the goals. Utilization of resources measures performance and effort over time.

➢ Technical aptitude enhancement

Aptitude is intended for a person's ability to acquire knowledge. The technical aptitude helps to reach candidates with problem-solving skills and critical thinking. Students are progressively trained on aptitude from the very beginning.

➢ Goal setting

Setting a goal starts with students' learning journey until they achieve the desired outcome. By setting goals, students can measure the effectiveness of their study methods. When setting a goal, it is important to consider the 'why' behind it. Why is it important to work together, to whom does this principle reflect the ideas and priorities, and who has ignored it? No one enjoys being forced to score goals. We feel honored and respected when we feel we have no control over the principles and processes by which we were created.

➢ Peer learning

Peer education is a learning process that enhances collaboration and collaboration to gain knowledge. Indeed, it is the students who should, from a different point of view and knowledge, respond to the problem without the intervention of the teacher. Each student is a recipient and an information provider.

➢ Help-seeking

Seeking assistance differs from other self-control strategies in that it involves other people, making it both a learning strategy and a social interaction. Obtaining assistance in the classroom is a social behaviour that includes peer interactions, group discussions, faculty or expert suggestions, and so on. Students may be concerned that seeking assistance in the classroom will affect how others perceive them.

➢ Concentration and focus

This strategy requires students to focus on the right thing. Tips to stay focused while studying online to create an effective learning environment, stay on track, write a daily to-do list, take notes, use a timer, minimize phone interruptions, and get enough sleep.

➢ Time management

Time management can be said to be a major challenge for online learning. It is easy to go to online classes and complete assignments in a timely manner. Students who use effective time management can complete a task in less time. Making good use of time reduces stress in their learning process. Therefore, it is said that one of the keys to student success is completing online courses with effective time management skills.

Results and Discussions:

The research is both descriptive and analytical in nature. The research method encompasses primary and secondary data, as well as their systematic analysis. The primary data is gathered through a survey using a questionnaire. Secondary data were gathered from various journals, websites, and other sources.

Chi-Square Test

H1: There is exists a relationship between the age of the respondent and the challenges of online learning.

TABLE – 1 TECHNICAL ISSUE

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.284[a]	6	.772
Likelihood Ratio	3.377	6	.760
Linear-by-Linear Association	.535	1	.465
N of Valid Cases	50		

6 cells (50.0%) have expected count less than 5. The minimum expected count is .30.

(source: software package, primary data)

The table shows that the test value of the chi-square value is 3.284 with a degree of freedom of 6 and a significance value of 0.772. Since the p-value is above 0.05 the null hypothesis is accepted which states that there is no significant relationship between the age of the respondent and the technical issue as a challenge of online learning.

TABLE 2 - DISTRACTION ISSUES AT HOME

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.945ᵃ	8	.154
Likelihood Ratio	12.381	8	.135
Linear-by-Linear Association	3.697	1	.054
N of Valid Cases	50		

a. 12 cells (80.0%) have expected count less than 5. The minimum expected count is 1.20.

(Source: software package, primary data)

The test value of the chi-square is 11.945 with a degree of freedom of 8 and a significance value of 0.154. Since the p-value is above 0.05 the null hypothesis is accepted which states that there exists no significant relationship between the age of the respondent and the distraction issue as challenges of online learning.

TABLE 3- TECHNOLOGY COST

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.156ᵃ	6	.524
Likelihood Ratio	4.866	6	.561
Linear-by-Linear Association	.836	1	.361
N of Valid Cases	50		

a. 9 cells (75.0%) have an expected count less than 5. The minimum expected count is 2.40.

(Source: software package, primary data)

The test value of the chi-square value is 5.156 with a degree of freedom of 6 and a significance value of 0.524. Since the p-value is above 0.05, accept the null hypothesis which states that there is no significant relationship between the age of the respondent and the technological cost as challenges of online learning.

TABLE 4 - HEALTH ISSUES

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.381ᵃ	8	.397
Likelihood Ratio	9.341	8	.314
Linear-by-Linear Association	1.624	1	.203
N of Valid Cases	50		

a. 13 cells (86.7%) have expected count less than 5. The minimum expected count is .30.

(Source: software package, primary data)

From the above table, shows that the test value of the chi-square value is 8.381 with a degree of freedom of 8 and a significance value of 0.397. Since the p-value is above 0.05, accept the null hypothesis which states that there is no significant relationship between the age of the respondent and the health issue as challenges of online learning.

TABLE 5- LACK OF IN-PERSON INTERACTION

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.228ᵃ	8	.836
Likelihood Ratio	4.661	8	.793
Linear-by-Linear Association	.269	1	.604
N of Valid Cases	50		

9 cells (60.0%) have an expected count less than 5. The minimum expected count is .30.   (Source: software package, primary data)

The table depicts that the test value of the chi-square value is 4.228 with a degree of freedom of 8 and a significance value of 0.836. Since the p-value is above 0.05 as such the null hypothesis is accepted which states that there is no significant relationship between the age of the respondent and the lack of in person interaction as challenges of online learning.

TABLE 6- LACK OF POWER SUPPLY

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.595a	8	.295
Likelihood Ratio	12.010	8	.151
Linear-by-Linear Association	.304	1	.581
N of Valid Cases	50		

a. 13 cells (86.7%) have expected count less than 5. The minimum expected count is 1.50.

(Source: software package, primary data)

The above table shows that the test value of the chi-square value is 9.595 with a degree of freedom of 8 and a significance value of 0.295. Since the p-value is above 0.05 the null hypothesis is accepted which states that there is no significant relationship between the age of the respondent and the lack of power supply as challenges of online learning.

MANN-WHITNEY TEST

The Mann- Whitney test is a nonparametric test of the null hypothesis that a randomly selected value from one population is equally likely to be less than or greater than a randomly selected value from a second population, and it can be used to determine whether two independent samples were drawn from populations with the same distribution.

H1: There is a significant relationship between the gender of the respondent and the challenges of online learning.

TABLE 7 - CHALLENGES OF ONLINE LEARNING

Group	Mean Rank	Mann Whitney U Test	P Value
Male	27.98	250.500	.226
Female	23.02		

(Source: software package, primary data)

From the above table, shows that the test value of the Mann-Whitney test is 250.500 with a significance value of 0.226. Since the p-value is above 0.05 the alternative hypothesis is not accepted which indicates that there is no significant relationship between the gender of the respondent and the challenges of online learning.

KRUSKAL-WALLIS TEST

Kruskal-Wallis test is conducted to study the relationship between strategies adopted to overcome the online learning challenges among the students and their level of satisfaction. The online learning strategies identified are Self-study (Variable1), Resource Management and Utilization (Variable 2), Technical Aptitude and Enhancement (Variable 3), Goal Setting (Variable 4), Peer Learning (Variable 5), Help-Seeking (Variable 6), Concentration and Focus (Variable 7), Time Management (Variable 8).

H1: There is a significant relationship between strategies adopted to overcome different online learning challenges and the level of satisfaction.

TABLE 8 STRATEGIES ADOPTED TO OVERCOME DIFFERENT ONLINE LEARNING CHALLENGES

	Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8
Chi-Square	.402	5.739	3.069	8.365	9.670	5.767	1.100	3.410
Df	4	4	4	4	4	4	4	4
Asymp. Sig.	.982	.220	.546	.079	.046	.217	.894	.492

(Source: software package, primary data)

The test value of the Kruskal-Wallis test Since the p-value is above 0.05 except for peer learning, therefore the hypothesis is not accepted which indicates that there is no significant relationship between strategies adopted to overcome different online learning challenges and the level of satisfaction.

GARRETT'S RANKING TECHNIQUE

Garrett's ranking technique was used to determine the most important factor influencing the respondent. According to this method, respondents were asked to rank all factors, and the results of such ranking were converted into score values using the following formula:

Percent position = 100 (Rij – 0.5)/ Nij

Where Rij = Rank given for the ith variable by jth respondents

Nij = Number of variables ranked by jth respondents The Percent Position and Garret Value

The Garret ranks were calculated by using the appropriate Garret Ranking formula. Based on the Garret ranks, the garret value was calculated.

TABLE 9 PERCENT POSITION AND GARRET VALUE

Rank	100(Rij-0.5)/Nij	Garrett value from table	Percent position
1	100 (1 – 0.5)/ 6	8.33	77
2	100 (2 – 0.5)/ 6	25	63
3	100 (3 – 0.5)/ 6	41.66	54
4	100 (4 – 0.5)/6	58.33	46
5	100 (5 – 0.5)/ 6	75	37
6	100 (6 – 0.5)/ 6	91.66	23

(Source: own processing)

The estimated percent position is converted into scores using Garrett's Table. The scores of each individual are then added for each factor, and the total value of scores and mean values of the scores are calculated. The factor with the highest mean value is regarded as the most important.

TABLE 10 ISSUES ENCOUNTERED DURING ONLINE LEARNING

Rank	Percentile position	Internet speed	Online exams	No lab sessions	Difficulty in hearing	Problem of electricity	Difficulty in understanding the content
1	77	38	1	2	2	5	2
2	63	6	17	2	7	15	3
3	54	3	13	9	10	15	0
4	46	1	11	14	12	5	7
5	36	1	4	15	13	8	9
6	23	1	4	8	6	2	29
Total		50	50	50	50	50	50

(Source: own processing)

Rank	Internet speed	Online exams	No lab sessions	Difficulty in hearing	Problem of electricity	Difficulty in understanding the content
1	2926	77	154	154	385	154
2	378	1071	126	441	945	189
3	162	702	486	540	810	0
4	46	506	644	552	230	322
5	36	144	540	468	288	324
6	23	92	184	138	46	667
Total	3571	2592	2134	2293	2704	1656

The highest value is internet speed (3571), most of the people are giving 1st rank to internet speed, followed by the problem of electricity, online exams, difficulty in hearing, no lab sessions and difficulty in understanding the content.

TABLE 11 STRATEGIES TO OVERCOME DIFFERENT ONLINE LEARNING CHALLENGES

Rank	100(Rij-0.5)/Nij	Garrett value from table	Percent position
1	100 (1 – 0.5)/ 8	6.25	79
2	100 (2 – 0.5)/ 8	18.75	68
3	100 (3 – 0.5)/ 8	31.25	60
4	100 (4 – 0.5)/ 8	43.75	53
5	100 (5 – 0.5)/ 8	56.25	47
6	100 (6 – 0.5)/8	68.75	41
7	100 (7 – 0.5)/8	81.25	32
8	100 (8– 0.5)/ 8	93.75	20

(Source: own processing)

Rank	Percentile position	Self study	Resource management & utilization	Technical aptitude enhancement	Goal setting	Peer learning	Help seeking	Concentration & focus	Time management
1	79	13	1	0	25	0	1	3	7
2	68	9	9	1	8	1	2	13	7
3	60	8	7	2	5	5	3	12	8
4	53	8	8	6	3	7	4	7	7
5	47	4	12	9	6	6	7	1	5
6	41	4	3	11	1	6	15	5	5
7	32	1	6	7	2	18	9	5	2
8	20	3	4	14	0	7	9	4	9
Total		50	50	50	50	50	50	50	50

(Source: own processing)

Rank	Self study	Resource management & utilization	Technical aptitude enhancement	Goal setting	Peer learning	Help seeking	Concentration & focus	Time management
1	1027	79	0	1975	0	79	237	553
2	612	612	68	544	68	136	884	476
3	480	420	120	300	300	180	720	480
4	424	424	318	159	371	212	371	371
5	188	564	423	282	282	329	47	235
6	164	123	451	41	246	615	205	205
7	32	192	224	64	576	288	160	64
8	60	80	280	0	140	180	80	180
Total	2987	2494	1884	3365	1983	2019	2704	2564

(Source: own processing)

The highest value is goal setting (3365) so most people prefer goal setting, followed by self-study, concentration & focus, time management, resource management & utilization, help-seeking, peer learning, and technical aptitude enhancement.

Findings:

From the research analysis, it is identified that most of the respondents prefer smartphones as a tool for online learning during the COVID-19 outbreak. Most of the respondents fall under the category of 16-18 age. About 54% of the respondent's preference for applying for attending online classes is google meet. It is found that 66% of respondents source of internet is mobile data rather than Wi-Fi. During the pandemic, it is found that 42% of respondents had spent 2-4 hours on online classes. Every respondent has problems during online classes during the pandemic. 30% of samples have experienced stress during the learning and not experienced stress during learning. 34% of respondents have more time to review materials on or before group discussion. Regarding the opportunities of online learning, 46% opined that online learning strengthens the skills of learners, 40% of samples agree that this is an opportunity for mobile learning, 50% sample says that there is an opportunity for new courses, 40% of respondents agree that online learning provides scope for innovation, 34% of respondents believe that there is increased quality of interaction in online learning. The study result indicates the relationship between strategies adopted to overcome different online learning challenges and the level of satisfaction is not positive except for the strategy of peer learning. Most of the respondent's strategies to overcome different online learning challenges is goal setting. According to the garret ranking technique, most of the respondent's major issues encountered during online learning is the internet speed.

Conclusion:

With the unexpected arrival of covid-19, academic activities are shifted to the electronic platform. The paper tries to identify and explore the challenges faced by students through online learning. These challenges included mainly technical issues, distraction issues at home, technology cost, causes health issues, lack of in-person interaction, and lack of power supply. The study indicates that students spend time in front of the screen for long hours and that creates several problems for them. The current study revealed that most students reported that they encounter several issues in online learning, but keeping this apart they are getting self-paced videos and content that they can utilize for their study. The results of the research show that there are several opportunities for online learning when the learning is done via online mode. The study revealed that there exists no relationship between gender and age in the challenges encountered in online learning. The analysis also reveals that there is no significant relationship between strategies adopted to overcome different online learning challenges and the level of satisfaction with online learning. There are several challenges regarding online learning and there are several strategies to overcome different online learning challenges. The findings of the study will help to assess these strategies and students can implement them to overcome the challenges that are faced through online learning.

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PROGRAM INCLUSIVE, CREDIT-BASED SWAYAM MOOCS IN HIGHER EDUCATIONAL INSTITUTIONS OF INDIA; A REVIEW

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ABSTRACT
The University Grants Commission, in its recent directions, has advised Higher Educational Institutions (HEIs) to deliver 20 to 40% of the program curriculum through credit-based MOOCs available on the SWAYAM portal. This paper reviews and analyses the various aspects related to this policy initiative. It probes the objectives of launching and delves into student and institutional readiness to implement this policy. The study is based on descriptive research methodology and relies upon bibliometric review and secondary sources such as AISHE (2019-20), UGC notifications, National Education Policy, 2020, MHRD, the Government of India, and a few relevant websites. It analyses the student success rate so far and reviews the possibility of MOOCs as an alternative to traditional educational setup and making them program inclusive. The findings reveal a huge gap between student enrolment and certification so far. The bibliometric review reveals a lack of consensus among researchers on various aspects of MOOCs. Making them program inclusive is a huge challenge with rich dividends attached.
Keywords: Program; SWAYAM; MOOCs; Credits; Higher: Education

1. Introduction
Around the world, today, widening participation policies are being advocated to ensure equal access to education by all learners irrespective of caste, colour, creed, and social background(Lambert, 2020). E-learning platforms are important information sources because of their accessibility low cost, simplicity of use, and intuitive nature(Banji et al., 2021). E- The Sustainable Development Goal (SDG 4) advocates equal and affordable access to quality education at all levels. The Gross Enrolment Ratio (GER) in India stands at 27.1%, in higher education for students between 18 and 23 years of age(AISHE Final Report 2019-20 - English, 2020.). One of the main targets of the National Education Policy, 2020 is to increase GER up to 50% by 2035(Aithal & Aithal, 2020). To meet this target, there is a need to develop an effective e-learning platform along with a robust mechanism of delivery and evaluation. Massive Open Online Courses (MOOCs) have gained importance over the years and can serve as an effective platform to widen access and ensure equal participation. MOOCs offer e-content, which is free with open admission and global reach (Singh & Chauhan, 2017). Students have a lot of independence and the benefit of self-paced learning from MOOCs because of the features like simple to use, affordable, adaptable, and easily available (Meet et al., 2022).

MOOCs that are well-designed can help to deliver higher education as per the recommendations of the National Education Policy, 2020. MOOCs can be a boon for emerging countries with a resource crunch and high inequality of income. Today, we all live in a digital world and thus e-learning will continue to grow. The Ministry of Human Resource Development (MHRD), Government of India (GOI), has always been at the forefront of devising policies to popularize online education through MOOCs (Bordoloi et al., 2020). The Indian MOOC platforms started their journey with the launch of NPTEL (I.I.T. Madras) in 2003, followed by mooKIT (I.I.T. Kanpur) in 2012, and IITBX (I.I.T. Bombay) in 2014. Swayam Portal is a recent addition in 2017 and has gained immense momentum over all these years. Swayam, as an e-platform, is into developing and delivering credit-based MOOC courses in all disciplines ranging from senior secondary level to post-graduation and offers world-class content for learning (Kundu & Bej, 2020a) This paper reviews and analyses various aspects related to the policy initiative of making credit-based SWAYAM courses a part of program delivery in HEIs of India.

2. Objectives of the paper
In this paper, an attempt has been made to:
- To discuss the evolution and objectives of credit-based Swayam MOOCs.
- To review the student and institutional readiness to execute program-inclusive MOOCs.
- To review the role of credit-based MOOCs in meeting the educational needs of India.
- To analyse the data concerning student enrolment and certification in these MOOC courses.

- To highlight the role of the National Testing Agency (NTA) and Academic Bank of Credits (ABC) in the delivery of a curriculum through credit-based MOOCs.

3. Methodology

This is a descriptive paper that is primarily based on a bibliometric review and secondary data. As highlighted by Porter et al. (2002), bibliometric literature review is applied when a detailed picture is to be drawn of a given aspect of knowledge. As this study aims at analysing the research findings regarding various aspects of credit-based SWAYAM MOOCs as highlighted in the previous section, a bibliometric review is the most suitable method. This paper has been written using descriptive research methodology and analysis is based upon both review and data available from secondary sources namely, All India Survey of Higher Education (2019–20), MHRD, Government of India; National Education Policy,2020, UGC (University Grants Commission) notifications, and websites such as Swayam Central and Class Central.

4. SWAYAM (Study Webs of Active–Learning for Young Aspiring Minds)

Keeping in mind the importance of e-learning, the concept of digitization of education through a dedicated platform in India started way back in 2003 with the establishment of NPTEL, which proved to be the premise for launching SWAYAM. Sivakumaren et al. (2019) highlight in their exploratory study that its origins may be traced back to 2003, when the NPTEL (National Programme on Technology Enhanced Learning), a joint initiative of I.I.T.s and IISc, was launched formally.

According to Mondal and Majumder (2019), SWAYAM is the cooperative project of the *MHRD* (Ministry of Human Resource Development) and the AICTE (All-India Council for Technical Education) to develop an online platform for teaching and learning. Recognizing the potential of MOOCs to educate society, *MHRD* of India launched SWAYAM in 2016, where lecturers from I.I.T.s, I.I.M.s, and central universities provide online courses to the public. Kanjilal and Kaul (2016), highlight that SWAYAM is an India-developed IT platform for hosting MOOCs to increase the *GER* (Gross Enrolment Ratio). Majumder (2019), also endorses the same and observe that SWAYAM is a feasible alternative with the ability to reform India's education system to improve the *GER* from 20% to 30%. The estimates now have been revised and NEP, 2020 aims at achieving 50% GER by 2035.

Agnihotri and Pandit (2021), noted that it was created to provide the best teaching-learning materials to all, especially disadvantaged groups, for free, to bridge the digital divide among students who have been left behind by the digital revolution. Parthsarthy (2020), add another perspective that SWAYAM provides an opportunity for the students to earn credits from the courses they pursue and use them in the completion of their respective programs. Chauhan and Goel (2017), In their descriptive study, highlight the potential of MOOCs in India through different platforms and the technology being used and observe that Swayam has offered a viable solution to the problem of MOOC deployment in India. To sum up, SWAYAM has been designed to achieve, free access, and equal opportunities to quality education.

Table 2.1: The objective of launching the SWAYAM portal

Objective	Author/Reference
SWAYAM is an I.T. platform created in India for MOOCs to increase the Gross Enrolment Ratio from 20% to 30% by 2020.	(Sivakumaren & Thangavel, 2019)
SWAYAM is a collaborative initiative of MHRD to develop an online teaching and learning platform.	(Mondal & Majumder, 2019)
Recognizing the educational potential of MOOCs in addressing the educational needs of, India, MHRD established SWAYAM.	(Bordoloi et al., 2021)
The aim of SWAYAM is, to provide the highest quality teaching and learning resources to everyone with a special focus on the disadvantaged.	(Agnihotri & Pandit, 2021)

Source: Author

4.1. *Learning through Credit-based SWAYAM MOOCs in Higher Education: Student's Perspective*
Chawla and Joshi (2012), in their exploratory study conducted on management students at the *IIM-A* (Indian Institute of Management, Ahmedabad) discovered that students undertaking e-learning courses must work on their behavioural, attitudinal, social, and technological readiness. Anand Shankar Raja and Kallarakal (2020), also note that SWAYAM MOOCs are only ideal for individuals pursuing higher education because they require technical abilities and rely heavily on self-discipline to study. They also point out that while MOOCs are unsuitable for many students for several reasons, they nevertheless assist millions of people in learning and preparing for the labour market. Kundu and Bej (2020b), through their qualitative survey of students enrolled in Indian state universities, concluded that MOOC awareness is higher among universities in urban regions as compared to the universities in rural ones and that postgraduate students are more aware than graduate students, the latter being more apprehensive about MOOC courses.

Gupta and Sambyal (2013), in their descriptive study, while listing the salient features of MOOCs hold a divergent view that they are flexible, easily accessible in a unique environment, and enhance personal learning. Toeing the same line, Nayek (2018) in his exploratory study on awareness among students about SWAYAM, highlights that the courses will benefit students from rural and remote areas, working professionals, and college dropouts and it would provide Indian students a fantastic opportunity to learn without fear of failing. J. B. Mohan (2017) in his study to identify factors that determine the choice of Indian students for MOOCs notes that one of the most important criteria in deciding whether or not to use them is the capacity to improve skill sets and knowledge and therefore, to attract learners, MOOCs must explicitly state the learning outcomes, skills that will be learned, and topics to be covered by the course.

TABLE 2.2: Student Perception and Feasibility of SWAYAM MOOCs

Student Traits/Feasibility	Author/Reference
Students enrolled in e-learning courses must improve their behavioural, attitudinal, social, and technological skills.	(Chawla & Joshi, 2012)
MOOCs are adaptable and simple to use in a personal setting, and they help students in their personal development.	(Gupta & Sambyal, 2013)
MOOCs are only suitable for those seeking higher education since they need technical skills and rely significantly on self-discipline to be successful.	(Anand Shankar Raja & Kallarakal, 2020)
The SWAYAM platform will assist students who reside in remote/backward regions, working professionals, and college dropouts alike.	(Nayek, 2018)
Students prefer MOOCs that can add skill sets and improve the knowledge base of students.	(M. M. Mohan et al., 2020)
MOOC awareness is high among Indian Students enrolled in institutions in urban areas and less among students from rural areas.	(Kundu & Bej, 2020a)
If the post-usefulness is higher, learners will be more satisfied with MOOCs and more inclined to keep using them.	(Rekha et al., 2022)

Source: Author

4.2 *Credit-based SWAYAM MOOCs, an alternative or aid to traditional education.*
Halabieh et al. (2022) advocate that flexible online environment has brought quality education to the door steps of the students. Parthsarthy (2020), highlights that MOOCs, along with an alternative to traditional learning, serve as a medium for educators, where they can explore videos and other content and get inspired to improve their teaching-learning style. Bast (2019), in contrast, notes that while the teacher's role is limited to fostering self-learning and peer-group conversations, traditional classrooms place an excessive emphasis on teachers, making them more teacher-centric and encouraging rote learning, whereas 'flip classes' offer a higher level of engagement. Therefore, SWAYAM can prove to be a platform capable of providing millions of people with extraordinary learning opportunities.

Jagetiya et al. (2018) observe that there is a paucity of qualified teachers in India, and an alternative must bridge the gap that exists between teachers and learners, and with advancement in information technology, students can learn through MOOCs in a flexible environment from the institutions like *IITs* (Indian Institute of Technology) and *IIMs* (Indian Institute of Management). Chakravarty and Kaur (2016) on the other hand, contest this view and note that MOOCs alone cannot lead to effective learning, and irrespective of the benefits they cannot claim to replace traditional educational delivery. Instead, a blend of both can only provide a balanced and wholesome education to youth.

Alcorn et al. (2015) observe that traditional higher educational institutions in India are grossly inadequate in addressing the educational needs of the rising student population in India, and there is a need for a high-quality model of education that is cost-effective and capable of catering to a vast student population, but they caution that MOOCs are primarily meant to serve professional training rather than for higher education. Mahajan et al. (2019) also, toe the same line and highlight the enormous potential offered by MOOCs. They advocate that these can be used in medical sciences for faculty development as well as the teaching-learning process, but it must be kept in mind that MOOCs cannot act as a panacea for all problems in the field of education and can never substitute the traditional mode of instruction.

TABLE 2.3: Credit-based SWAYAM MOOCs: An aid or alternative to Traditional Educational Setup

Student Traits/Feasibility	Author/Reference
Flexible online environments provide an opportunity for students to complete their studies from the comfort of their homes or localities leading to easy access to quality education while keeping their family and community connections intact.	(Halabieh et al., 2022)
SWAYAM MOOCs, along with an alternative to traditional learning, inspire teachers to improve their teaching-learning style.	*(Parthasarathy, 2020)*
The teacher's role is limited to fostering self-learning and peer-group conversations in SWAYAM MOOCs, and the traditional setup overemphasizes the role of the teacher.	(Bast, 2019)
Due to the paucity of qualified teachers, SWAYAM fills the gap, which exists between teachers and learners, and students can learn in a flexible environment from the institutions like IITs and IIMs.	(Jagetiya et al., 2018)
Irrespective of the benefits, MOOCs cannot claim to replace traditional educational delivery; an optimum blend of both can only provide balanced and wholesome education to youth.	(Chakravarty & Kaur, 2016)

Source: Author

4.3. *The role of Credit-based SWAYAM MOOCs in meeting the educational needs of India.*

Gupta and Sambyal (2013) in their conceptual paper conclude that using MOOCs in higher education would decrease government expenditure along with achieving a better quality of teaching and learning. It will also make education more accessible. The study by Kanjilal and Kaul (2016) highlights the journey of SWAYAM relating it to the establishment of NPTEL in 2003. The authors acknowledge SWAYAM as an indigenous MOOC platform that can revolutionize education and a key driver in achieving 30% *GER* in higher education. They conclude that it is instrumental in creating opportunities for continuous learning. Ahamed (2022) and (Kumar and Kumar (2020) note that the skill gap in the current Indian workforce may be bridged with the help of MOOCs. These courses are taught by expert professionals and provide students with practical experience along with theoretical conceptual knowledge. Complementing this view, Mondal and Majumder (2019) also observe that the proposed SWAYAM and SWAYAM PRABHA programs work in tandem, augmenting and complementing one another. They further add that making the SWAYAM course program inclusive will have a positive impact on achieving the nation's dream of universal education access and can play a critical role in 'Digital India, and 'Skill India' initiatives, if adequately planned and implemented.

TABLE 2.4: SWAYAM: Role in meeting the educational needs of India

Observation/Finding	Author/Reference
MOOCs will reduce government expenditure on higher education. They will improve the quality of teaching-learning and make it more accessible.	(Gupta & Sambyal, 2013)
SWAYAM, as an indigenous MOOC Platform can revolutionize education and act as a key driver in achieving 30% GER in higher education.	(Sivakumaren et al., 2019)

The inclusion of the SWAYAM program in, the formal education system will help in universal educational access and can play a critical role in 'Digital and Skill India' initiatives.	(Mondal & Majumder, 2019)
The skill gap in the current Indian workforce may be bridged with the help of MOOCs	(Kumar & Kumar, 2020)
The majority of the students agree that SWAYAM courses are helpful in lifelong learning and enhance knowledge and skills.	(Ahamed, 2022)

Source: Author

4.4 *What do the data indicate about student enrolment and certification? An analysis.*

As of 5th May 2022, the total number of students enrolled in credit-based SWAYAM MOOCs is over 18 million, out of which only 8.29% a little more than 1.5 million registered for exams, and around 5.74% i.e., over a million students were successfully certified. Policymakers should make serious deliberations to reduce this gap. Otherwise, the whole purpose of making credit-based MOOCs a part of the curriculum in higher education will be defeated. Assessment through proctored examination needs to be more student-friendly and higher educational institutions should be made part of it.

Table 2.5: Students Enrolled, Registered, and Certified in SWAYAM MOOCs.

Students Enrolled	*18249679*
Number of Students Registered for Exams	*1513096*
Number of Students Successfully Certified	*1047828*

(Source: Author (Data sourced from Swayam Central)

Figure:1
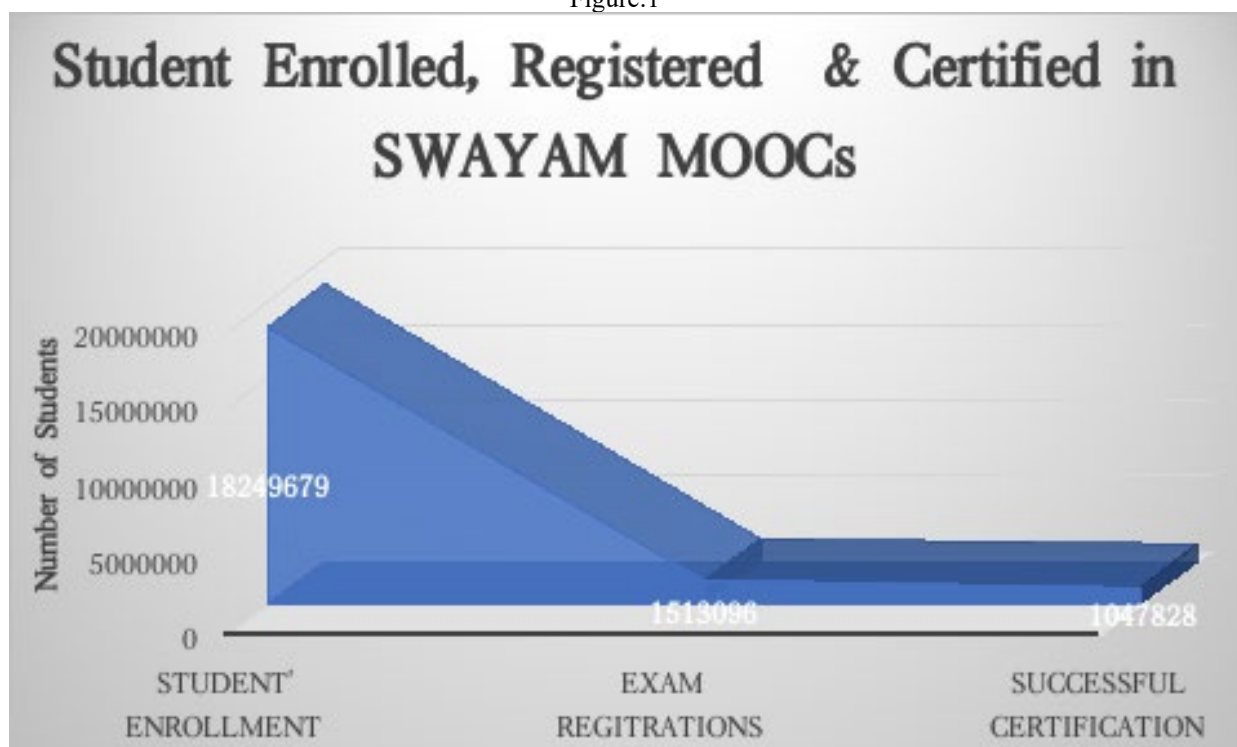
(*Source: Author (Data sourced from Swayam Central*)

SWAYAM MOOCs are credit-based and students can enrol without paying any fee, however, the learners who desire a SWAYAM certificate have to pay a very nominal amount to appear for proctored tests in person at designated centres on specific days. The learners get certificates after they clear these exams and meet the eligibility condition and can also get the credits transferred to their respective HEIs using the facility to be provided by Academic Bank of Credit (ABC). The National Testing Agency (NTA) was founded as a central, specialised, autonomous, and self-sustaining testing agency to administer entrance tests for admission and fellowship in higher

educational institutions, and has been tasked with administering these proctored tests' conducts various online tests, such as admission exams, regular degrees, refresher programs, and is also playing a significant role in evaluating and analysing students' performance in SWAYAM courses(Ahmed & Panchalee, 2019).

4.5 *Credit Transfer and Evaluation of SWAYAM MOOCs: A Challenge*
The UGC (Credit Framework for online learning courses through SWAYAM) Regulation 2016 has already been released and HEIs are to ensure the transfer of credits for courses taken on SWAYAM. All India Council for Technical Education (AICTE) published a gazette notification for the acceptance of these courses for credit transfer. To facilitate this process, *UGC (Establishment and Operationalization of Academic Bank of Credits (ABC) Scheme in Higher Education) Regulations, 2021,* has been initiated and the Academic Bank of Credits (ABC) has been set up under the aegis of the MHRD. Initially, to register in ABC, it was mandatory for HEIs to either have National Assessment and Accreditation Council (NAAC) 'A' grade or be in the top 100 National Institutional Ranking Framework (NIRF). Because of these preconditions, only around 20 higher educational institutions could be onboarded till recently.

On January 12, UGC notified through the *University Grants Commission (Establishment and Operation of Academic Bank of Credits in Higher Education) (First Amendment) Regulations, 2021,* notified that the HEIs satisfying sub-regulation 2 of regulation 1 and the institutions of eminence that by an Act of Parliament are empowered to confer or grant degrees can participate and register in the Academic Bank of Credits irrespective of their NAAC or NIRF ranking. This amendment is a welcome step and will give impetus to the registration of higher educational institutions in the ABC. The UGC has also issued an advisory to its affiliate institutions to spread awareness among the students to register their accounts in ABC to avail the facility of credit transfer. The total enrolment is estimated to be 38.5 million in undergraduate & postgraduate programs and if the policy is to cover all in this ambit, it will be a herculean task. Success at this scale will only be possible through proper planning and coordination among *NTA*, HEIs, and other stakeholders.

5. Findings and Suggestions: The discussion of the various aspects of SWAYAM in the previous section reveals both complimentary and contradictory findings. One set of researchers claims that MOOCs provide an alternative to traditional learning, whereas another concludes that they can be used as an aid to augment learning but they cannot replace the traditional education system. Considering the difference between student enrolment and certification in MOOCs across the various platforms, credit-based MOOCs should become a part of the formal curriculum under the guidance and supervision of a teacher and are most suitable for blended learning. Most students in HEIs are from a rural background and previous studies reveal that students' awareness in urban-centred universities is far more than in rural-entered universities. Therefore, a special drive to make students with rural backgrounds aware of the importance of MOOCs is needed. They should be provided training to enable them to learn from MOOCs. This will ensure that many students who enroll in these courses can get certifications too. The review also highlights that to learn from MOOCs, students must work on their behaviour, and attitude along with social and technological skills. Moreover, it was also found that undergraduate students are apprehensive about pursuing these courses. A campaign must be launched to sensitize undergraduate students about the benefits of MOOCs.They should also be trained to imbibe the skills required to learn from them.

Regarding the universalization of Education in India, Mondal and Majumdar (2019) observe that incorporating SWAYAM courses into the formal education system will help in achieving universal access to education. Phutela and Dwivedi (2020) also observe that the future potential of e-learning in India is high, as the number of students adopting e-learning continues to increase. In contrast, Sivakumaren et al. (2019) discovered that the growth of Swayam courses reflects a decreasing trend. Kundu and Bej, (2020a) observes that despite the low degree of satisfaction among students and teachers at Indian state universities from MOOCs, enrolment rates in these courses are still high. This reflects a contradiction in the behaviour of students regarding the choice of MOOCs. Therefore, a pan-India study on student perception of credit-based MOOCs is warranted to ensure meaningful steps are taken to use MOOCs as an aid in augmenting learning.

The role of ABC is of paramount importance in the successful rolling of MOOCs in the formal curriculum of HEIs. To ensure institutions can adapt to this new change, they should register with ABC. By the end of 2021, only 20 institutions could do so due to the limiting conditions in terms of NAAC certification and NIRF ranking. A recent amendment in January abolished these conditions and allowed Government recognized institutions to register with the ABC. The research suggests that to achieve the inclusion of credit-based MOOCs in programs, HEIs, and other institutions recognized by the Government must register in ABC. There is a need to follow a common policy framework irrespective of rankings for the benefit of students with diverse backgrounds.

6. Conclusion

Significant research and findings indicate that SWAYAM as a MOOC platform is a suitable tool to increase free access to education through e-learning. It is cost-effective and feasible for students who can self-regulate their studies. SWAYAM is a viable option for aiding the traditional educational setup. Flexible and coupled with free enrolment, these courses can be used to aid formal learning and thus can give impetus to Gross Enrolment Ratio in India. Formalization of MOOC courses in higher education is a welcome step and is found to be more suitable for blended learning. Few research findings also indicate that these courses are more suitable for continuous professional learning rather than for regular students. Therefore, these courses need to be designed keeping in mind the learning outcomes and the objectives of the students who enroll. In May 2022, over 18 million students were enrolled in SWAYAM MOOC courses from various parts of India. This reflects that it can be used effectively to upgrade the skill set over the years by ensuring that a large number of these enrolments are converted into certifications. Low certification is a cause of concern. This indicates that a robust program execution coupled with evaluation, and a credit transfer system will have to be put in place to ensure an increase in certifications along with enrolments. Making the SWAYAM MOOCs program inclusive in HEIs is a gigantic task that warrants a proper study to develop a suitable policy, procedure, infrastructure, and mechanism to ensure its success.

Research limitations– The paper's discussion is limited to policy implementation of credit-based MOOCs regarding the indigenous portal, SWAYAM, students, and HEIs in India, and is a general study only.

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SIGNIFICANCE OF VIRTUAL LEARNING ENVIRONMENT IN INDIAN EDUCATION SYSTEM

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ABSTRACT

A Virtual Learning Environment (VLE) is a system that creates an interactive educational experience, usually involving student-to-student and student-to-teacher interaction. The main purpose of a VLE is to provide an online space where students can access course materials, submit assignments, and receive feedback from their instructors. A VLE may also include features such as discussion boards, chat rooms, and video conferencing to facilitate collaboration and communication among students. While VLEs are most commonly used in higher education, they are also being used more frequently in K-12 classrooms. As the use of technology in education continues to grow, VLEs will likely become even more prevalent in schools.The present study is aimed at to study the significance of virtual learning environment in Indian education system with reference to higher education. To achieve the objectives the study researcher collected the data from 460 respondents (teachers and students) from Pune city. The findings of this study will help education sector to implement virtual learning environment in the best effective way.

Keywords: Virtual Learning Environment, Higher Education, Management Education, etc.

Introduction

Concept of Virtual Learning Environment

A virtual learning environment (VLE) is a system that creates an interactive, online space in which learners and educators can access educational resources, communicate with each other, and track progress. VLEs are typically used in schools and universities as a way to deliver courses and support collaboration between students and teachers. However, they can also be used in workplace training or by any organization that wants to provide its members with online learning opportunities.

There are many different types of VLEs available, ranging from simple platforms that only provide basic course materials to more robust systems that include features such as forums, chat rooms, and video conferencing. Some VLEs are open source and can be downloaded and installed on a server, while others are hosted by commercial providers.

Importance of Virtual Learning Environment

A virtual learning environment (VLE) is a system that creates an interactive, online space in which teachers and learners can access educational resources, communicate with each other, and collaborate on projects.
A VLE can be used for a wide variety of purposes, including:

- Providing learners with access to course materials and resources
- Facilitating communication and collaboration between learners and between teachers and learners
- Supporting assessment and feedback processes
- Enabling the delivery of courses and programmes entirely online

There are many different types of VLEs available, ranging from simple platforms that provide basic functionality to complex systems that offer a wealth of features and tools. The important thing is to choose a VLE that is fit for purpose and meets the needs of your organisation or institution.

Present and Future Scenario of Virtual Learning Environment

The current situation is that many students are enrolled in virtual learning environments, or VLEs. In a VLE, students can access their course materials and interact with their instructors and classmates online. This type of learning environment has several advantages, including the ability to tailor the learning experience to the individual learner, the flexibility to learn at one's own pace, and the convenience of being able to access courses from anywhere in the world.
Looking to the future, it is likely that VLEs will become even more popular as they continue to evolve and become more user-friendly. Additionally, as more institutions begin to offer online courses, the need for VLEs will increase. As a result, we can expect to see more innovative features and capabilities added to VLEs in order to meet the needs of both students and instructors.

Tips for using Virtual Learning Environment
If you're new to using a virtual learning environment (VLE), there are a few things you should keep in mind to make the most of it. Here are some tips:
1. Get familiar with the interface and navigation
Spend some time exploring the VLE and getting comfortable with how it works. This will make it easier to find what you need when you're trying to use it for class.
2. Take advantage of all the features
A VLE can offer a lot, from discussions and forums to multimedia content and collaboration tools. Be sure to check out all the features your VLE has to offer so you can get the most out of it.
3. Stay organized
It's easy to get lost in a VLE if you're not careful. Stay organized by creating folders for each class or subject, and adding relevant files and resources into each one. That way, you can always find what you need when you need it.
4. Keep up with announcements and updates
Your VLE will likely have a announcements section where updates and important information will be posted. Be sure to check this regularly so you don't miss anything important!
5. Participate in discussions and forums
An active participation in discussions and forums is often expected in a VLE-based course. Don't be afraid to contribute - it's a great way to learn from others and get involved in the course material

Strategies to Apply Virtual Learning Environment
There are many strategies that can be used in a virtual learning environment to engage students and promote learning. Some of these strategies include:
- Using multimedia resources such as videos, images, and audio to enhance learning
- Creating opportunities for collaboration and interaction between students
- Utilizing tools such as forums, chat rooms, and blogs to encourage communication
- Designing engaging and interactive activities and assessments
- Providing clear and concise instructions to guide students through the learning process

By using these strategies, educators can create a virtual learning environment that is both effective and enjoyable for students.

Challenges while applying Virtual Learning Environment
The challenges of virtual learning environments are numerous. First, there is the issue of access. Not all students have access to a computer or the internet at home, which can limit their ability to participate in online learning. Additionally, online learning can be isolating for some students, as they may not have the opportunity to interact with their peers and teacher in person. Another challenge of virtual learning environments is that they can be distracting. Students may be tempted to check social media or play games instead of paying attention to the lesson. Additionally, it can be difficult for teachers to keep students engaged in an online setting. Finally, there is the question of assessment. It can be difficult to assess student learning in an online environment, as there is no face-to-face interaction and limited opportunities for formative assessment.

Opportunities in Virtual Learning Environment
There are many opportunities that a virtual learning environment can offer. For example, it can allow students to have more control over their learning. They can pause, rewind, and review material as often as they need to. It can also provide a more engaging and interactive learning experience. Additionally, a virtual learning environment can allow for a more flexible schedule since students can access the material at any time and from anywhere.

Virtual Learning Environment in Management Education
In management education, a virtual learning environment (VLE) is a type of online learning platform that allows students to access course materials and resources, submit assignments, and communicate with their instructors and classmates. VLEs are often used in distance learning or blended learning programs, where students may not have the opportunity to meet in person on a regular basis.

The use of VLEs in management education can provide several benefits for both students and instructors. For students, VLEs can provide 24/7 access to course materials, which can be particularly helpful for those who have busy schedules or who are located in different time zones. Additionally, VLEs can allow for more flexibility in terms of when and where learners can complete their work. And finally, VLEs can facilitate communication and collaboration between students and instructors, as well as between classmates. There are a number of different software platforms that can be used to create a VLE. Some popular options include Blackboard Learn, Moodle,

Canvas, and Google Classroom. When selecting a platform for your VLE, it is important to consider the needs of your specific course or program as well as the preferences of your students.

Literature Review

VLE system is established on the Internet, it doesn't require any other kind of communication to provide the courses. Additionally, there won't be any significant costs associated with creating a unique, high performance network to provide these courses. Since any Internet browser that supports HTML forms can be used as the frontend, any machine with an Internet connection can access the VLE system Kumar, Raj Pakala, r. K. Ragade, j. P. Wong (1998).

As a collection of interconnected systems with properties like a planned information space, a social space that is a "place," and players who are active and present actors, we termed a "virtual learning environment" (VLE). We contend that taking advantage of a virtual learning environment does not automatically ensure efficacy. Rich pedagogical scenarios must be integrated with it, and these scenarios must profit from its numerous assisting aspects. It runs the risk of missing intriguing areas of study and development that may and should enhance education if the "virtual learning environment" concept is applied to any type of Internet technology (traditional Web sites, learning management systems, 3D environments, etc.). (Pierre Dillenbourg, Daniel Schneider, Paraskevi Synteta, 2002). According to the study, the VLE has a substantial impact on students' success on the Design Project in the final year of the BEng Civil Engineering programme at Loughborough University, but a negligible impact on their academic achievement in the Geotechnics 3 module. The use of VLE and academic performance exhibit insignificant correlations according to Spearman's and Pearson's correlation coefficients Peter Demian (2015).

The advantages of these VLE outweigh the drawbacks for both students and institutions by a wide margin. The student can internalise knowledge and build problem-solving skills through context-rich guided learning, which can then be applied in the real world. Virtual learning environments are certain to expand in the future because to the falling cost of technology and the increasing technical expertise within educational institutions Arvind Mahajan (2016).

The Influence of Virtual Learning Environments in Students' Performance," they mentioned that,we provide a summary of the key findings from a study that involved 6347 undergraduate students from a Portuguese public higher education institution and was conducted over the academic year 2014–2015. This study sought to determine how frequently students used the virtual learning environment (VLE) that the institution had implemented, as well as the relationship between that frequency and the students' academic achievement. The study was quantitative in nature, and the data came from databases linked to the VLE.

Students are encouraged to learn new things in a virtual learning environment thanks to their involvement in Moodle. When using Moodle to help students learn a language, it's crucial to make sure that the students are aware of the opportunities and the importance of this type of learning, which can help them become more competent and self-aware, value lifelong learning, and develop their life skills. Teachers must explain to pupils the goals, the expected learning outcomes, how to recognise the learning outcomes, and the tactics and approaches to be applied when learning occurs in order to attain these results, Dalia Gulbinskiene et.al (2017).

Students' lives have been easier and more understandable thanks to virtual learning settings. In educomp, the complicated theories have become simple to understand. Concepts and experiments have gotten a lot simpler to understand. The results of the practical exam have significantly improved. Recalling the topics has been simple for the students. Students now find studying science to be exciting with the development of virtual learning environments. Even the aversion to math and science has diminished, Amritesh PS, Jeayaram Subramanian (2019).

College teachers prefer using blended learning environments, which combine traditional face-to-face instruction with online learning. They do not advocate using purely online learning environments or entirely face-to-face instruction. It is important to note that the majority of Iraqi college professors believe that virtual learning can improve students' autonomy in studying but may have a detrimental impact on their relationships with their professors, LiqaaHabeb Al-Obaydi (2020).

Institutations would be required to ensure that research reflects areas of need in communities if educational research has an ethical component. It is our intention that this scoping study will offer a small window into the state of research on student mental health in VLE settings while also highlighting the necessity of new research projects in the K–12 arena. As things stand, there's a good chance that K–12 students are using VLE

implementations that don't actively embrace the features of a VLE that offers sound best practises and supports the requirements of kids with regard to their mental health Aura Caprara,Cataldo Caprara (2021).

There are the three main conclusions from the views of professors and RUB students on the usefulness of the VLE for online TLA: (a) The CA are more skilled than the CS at using VLE features for online TLA. The presence of a reliable network, timely internal workshops, prior exposure to fundamental VLE elements, and ICT knowledge are the variables that have strengthened their competencies. However, the majority of students had issues when taking online classes. Their inability to actively learn is hampered by unstable networks, inconsistent power supplies, poor study conditions, a lack of financial support, and technical difficulties. However, with help from friends, teachers, and family, the majority of students were able to overcome these obstacles, Ugyen Pem et.al (2021).

Research Methodology
Objectives of the study
- To study the concept of Virtual Learning Environment.
- To study the importance of virtual learning environment in higher education system of India.
- To study the opinion of teachers and students about Awareness, Usage, Ease of implementation and effectiveness of Virtual Learning Environment.

Scope of the study
- The present study is related to only Private and State Universities in Pune.
- The present study related to only three educational wings, MBA, MCA and Engineering.

Reliability Test

	Cronbach's alpha
Q1	0.830
Q2	0.870

As the Cronbach alpha observed is more than 0.700 for both the questionnaire, the questionnaires are considered as valid.

Sampling Technique
The researchers have collected the data using survey method from 460 respondents with the help of convenience sampling method.

	State Universities	Private Universities
MBA		
Teachers	20	20
Students	50	50
MCA		
Teachers	20	20
Students	40	40
Engineering		
Teachers	30	30
Students	70	70
	230	230

Data Analysis
Measurement tool: 5 point Rating Scale

	1	2	3	4	5
Awareness	Very low awareness	Low awareness	average	High Awareness	Very high awareness
Usage	Very low usage	Low usage	average	High usage	Very high usage
Ease of Implementation	Very difficult	Difficult	average	Easy	Very easy
Effectiveness	Very less effective	Less effective	average	Highly effective	Very high effect

Virtual Learning Environment in Private Universities

	Awareness	Usage	Ease of Implementation	Effectiveness
MBA				
Teachers	4.3	3.9	3.3	4.8
Students	3.6	3.3	3.7	4.4
MCA				
Teachers	4.2	4.2	3.7	4.5
Students	3.6	3.5	3.4	4.1
Engineering				
Teachers	4.7	4.5	4.4	4.7
Students	3.9	4.1	4.2	4.6
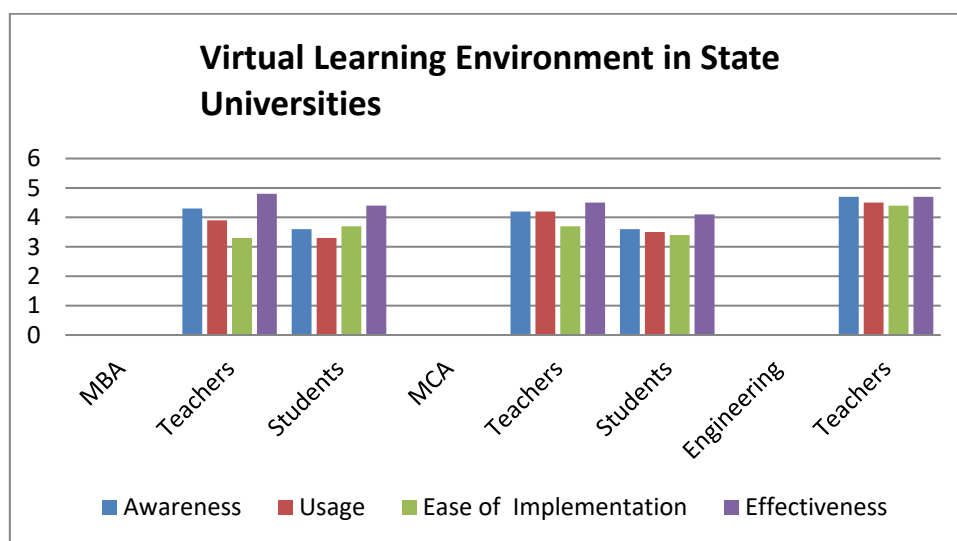
Virtual Learning Environment in Private Universities

	Awareness	Usage	Ease of Implementation	Effectiveness
MBA				
Teachers	4.5	4.1	3.4	4.9
Students	3.8	3.6	3.8	4.2
MCA				
Teachers	4.4	4.3	3.8	4.7
Students	3.7	3.8	3.7	4.5
Engineering				
Teachers	4.8	4.7	4.5	4.9
Students	4.1	4.2	4.3	4.8

Virtual Learning Environment in Private Universities

Legend: ■ Awareness ■ Usage ■ Ease of Implementation ■ Effectiveness
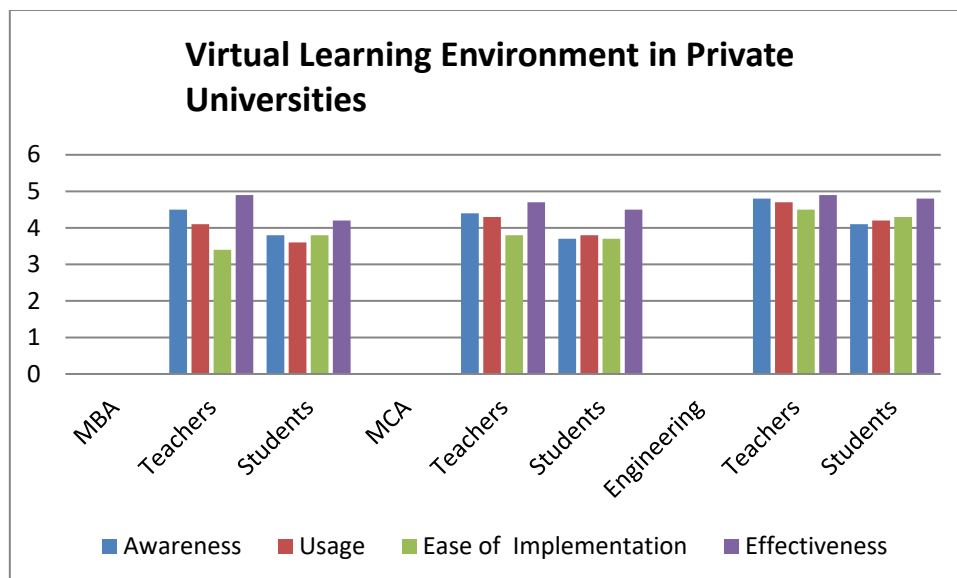
Conclusion

From the present study it is observed that both private universities and state universities teachers and students are agreed that virtual learning environment is important for their academic curriculum.

Contribution to Industry

This research study will be helpful to education sector to design new strategies related to virtual learning environment which will be beneficial to improve academic performance.

Contribution to Academicians

This research study will be helpful to teachers to implement virtual learning environment in the best effective way.

Contribution to Students

This research study will be helpful to students to understand the concepts related to virtual learning environment etc

Scope for the further research study

There is also a further scope for the research on the topics like e learning, blended learning, online education, digital education etc.

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STUDENTS' PERSPECTIVE ON THE EFFECTIVENESS OF ONLINE LEARNING: EVIDENCE FROM ASSAM, INDIA

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ABSTRACT

Application of technology has revolutionised the system of education today. New emerging technologies are changing the way we learn and interact with the world. Online learning has created a new dimension in education. lt has made educational content and information accessible to anyone at their own pace and convenience around the world. The recent COVID -19 pandemic has affected educational system worldwide. Closure of educational institutions due to COVID-19 pandemic have brought significant transformation to teaching learning process across the world. Due to prolonged closure of educational institution most educational institution shifted to online mode of learning to keep the academic activities going as a result there is a trend of increasing use of educational technology by both teacher and students. However, the questions about the advantages, potential challenges and drawbacks, students' motivation and effectiveness of online learning is still not clearly explored and understood particularly for a developing country like India. It is still a significant barrier to integrate technology into education. A large section of students does not have access to device or high-speed internet connection. They are disproportionately impacted by the digital divide. This study is basically conducted to understand the perspective of students on effectiveness of online learning. This study also explores the student's motivation towards online learning along with its benefits and drawbacks ln this study, the data were collected from the students of different backgrounds pursuing higher education.

Key words: Students' perspective, effectiveness, online learning, Assam, India

Introduction:

Today the word "Education" itself is undergoing a re-defining process. From the narrow limitations of the four walls of the classroom, it has encompassed everything in the universe and has taken a holistic outlook beyond time and space. In the backdrop of such rapid changes, it is important that the methods and approaches to education also are subjected to the demands of changing times.

The use of technology has enriched the world in all walks of life including that of education. One can see and feel the change in air as classrooms are becoming modern and teachers and students are benefiting with gadgets such as computers, Smartphones, tablets etc. The advent of internet has made a sea of change in the way teachers can demonstrate concepts and ideas to children and make learning almost fun. Information today has been encapsulated in internet which can be beautifully used to allow learning to be a fun rather than being a drudgery. Application of technology in education also includes use of other tools like Cameras (both still and video), overhead projectors, LCD projectors, computer, smartphones, internet, various software (like Power Point) to make presentations, sound recorder, and acoustic system etc. to augment classroom instruction. Overhead projectors and PowerPoint software enhance lectures by emphasizing key points and incorporating photos, graphs, and cartoons into presentations that would otherwise lack visual interest. Slides and transparencies are of great help for instructors as those can be prepared in advance to save time. Application of technology has revolutionized the system of education today. Now there is a trend of increasing use of technology by both teachers and learners. It has been contributing a lot to the improvement of products and processes of education at all levels and stages of planning, implementation, and evaluation.

Since the Internet was developed as a means of communication by educational institutions in the 1970s. Academics have become increasingly aware about the possibilities of online learning to deliver cost effective, easily accessible, and ever-current education to all ages and social backgrounds, regardless of time and geography. Online learning means the learning process that takes place by using a computer that is connected to the internet. The internet is an electronic communication network that connects computer network and organizational computer facilities around the world. The internet consists of the collection of billions of interconnected web pages that are transferred using HTTP and is collectively known as World Wide Web. If someone wants to surf the Web using browser, i.e., move from one page or one website to another, then they must be online.

Online learning and classes are increasingly becoming part of the education system worldwide. Online channel has made education convenient and easily accessible by one and all. Education sector in India has been an ever-growing entity. India has been one of the largest sectors in the world when it comes to higher education. Though online and distance courses have been there from a long time, introduction of the online mode of taking classes in comparison to the traditional face to face classroom approach in universities and colleges have been considered only in the last few years in India. When it comes to the Indian educational system, face to face classroom approach has always been the most prominently used.

Recently the ministry of human resource development has been renamed the ministry of education and this education ministry has released a new education policy with a vision to reshape the education system of India. They aim to transform the education standards of India by the end of 2040. One of the key tenets of the National Education Policy (NEP) 2020 is the acceptance of online education as a mainstream delivery mechanism.

In the age of the internet and the personal computer, the phrase "online education" is heard regularly regarding schooling at nearly every level. It has changed the concept of teaching and learning as we know it. In today's world, the internet can be used as the primary means of instruction and assessment. online classes are synchronous events organized in a live virtual meeting room where students and teachers meet to communicate with voice, video, whiteboard. It is a set of instructional experiences using the digital network for interaction, learning and dialogue. An online learning does not require any face-to-face meetings in a physical location. Online classes are the delivery of a series of lessons on a web browser or mobile device, which can be accessed anytime and anyplace.

Educational institutes across the world have closed due to the COVID-19 pandemic jeopardizing the academic calendars. Most educational institutes have shifted to online learning platforms to keep the academic activities going. However, in the wake of current COVID-19 pandemic situation conduction of online classes at college and university level has been made mandatory by the educational boards. Covid-19 has brought out a drastic change in the educational system not only in India but rather the entire world. Universities across India as well as around the globe have moved to the virtual classes suspending physical classrooms. University faculties are setting up accounts on online video conferencing platforms such as Zoom, Skype, Google Classroom, Meet, among others to engage with students. Online education in India is at an early stage of development.

Significance of the study:
The use of technology has enriched the world in all walks of life including that of education. Most of the learners who may not have time and resources for getting access to the class -bound learning experiences may get it easily at their convenience in the form of e-learning. E-learning covers a wide set of electronic educational applications and processes such as web-based learning, computer-based learning, virtual classroom etc. lt includes delivery of content via network, audio, and video recordings, satellite broadcast, interactive T.V and CD-ROM etc. Which made it possible to help the to access information and educational contents at any time and any place.

Technology is changing the face of teaching-learning and education. Teachers have more resources available to present the content and learning experiences, and students have more opportunities to engage themselves in learning. The teaching and learning are increasingly becoming more and more effective with the intervention of technology.

At present era, many educational institutions resorted to online mode of learning due to COVID 19 crisis. The prolonged closure of educational institution during the COVID-19 pandemic made online mode of learning a necessity these days. The rapid shift to e-learning prompted by the pandemic has resurfaced long-standing issues of inequality and a digital divide in India due to which certain section of learners who are not privileged enough to have access to technology are deprived of getting education through online mode. This is one of disadvantages of online mode of learning

This study attempted to study the perspective of students on the effectiveness of online learning.

Objectives: The objectives of the present study are:
1. To study the student's perspective on effectiveness of online learning.
2. To study the benefits and drawbacks of the mode of online learning from the perspective of students.
3. To know the motivation level among students using online learning.

Research methodology
Method used:
This study focuses on the perspective of students on effectiveness of online learning. In order to achieve the objective of the study, the researcher used the descriptive research method of research which was best suited to the study.

Sampling technique:
In the present study, random sampling has been used to draw sample from the desired population.

Population
The target population for the present study has been defined as post graduate students of Guwahati city aged 21 to 24 years who have attended online classes to attend their course of study during Covid-19 pandemic.

Sample:
Since it was not feasible to include all the students of Guwahati city in the study for data collection, a representative sample was drawn comprising of 84 U.G and P.G students belonging to different educational institution such as K.C das commerce College, Arya Vidyapeeth, Cotton University and Guwahati University of which 16 were males and 68 were females The technique used to select the sample was random sampling.

Tool used:
ln this study a questionnaire was used as it was considered most favourable tool for data collection

Questionnaire
For this study a questionnaire was prepared in google forms consisting of 29 questions on the topic of the study was set according to the objectives of the study.

Data Collection
Data used for this study are both primary and secondary data.

Primary data: To collect primary data a questionnaire was prepared containing number of questions and distributed among the respondents via online platforms.

Secondary data: The secondary data was collected from numerous sources such as newspaper, articles, journals, book research, reviews, online websites etc.

Analysis and Interpretation of Data:
Table I. Demographic characteristics of respondents

	Frequency	Percentage
Gender		
Male	16	19
Female	68	81
Total	84	100
Education		
Graduation	49	58.3
Post-graduation	35	41.7
Total	84	100
Educational background		
Humanities	61	72.6
Science	18	21.4
Commerce	2	2.4
Technical	3	3.6
Total	84	100

Graphical representation of table no.1
Title: Demographic characteristics of respondents

Figure:1
Interpretation of demographic characteristics of respondents:
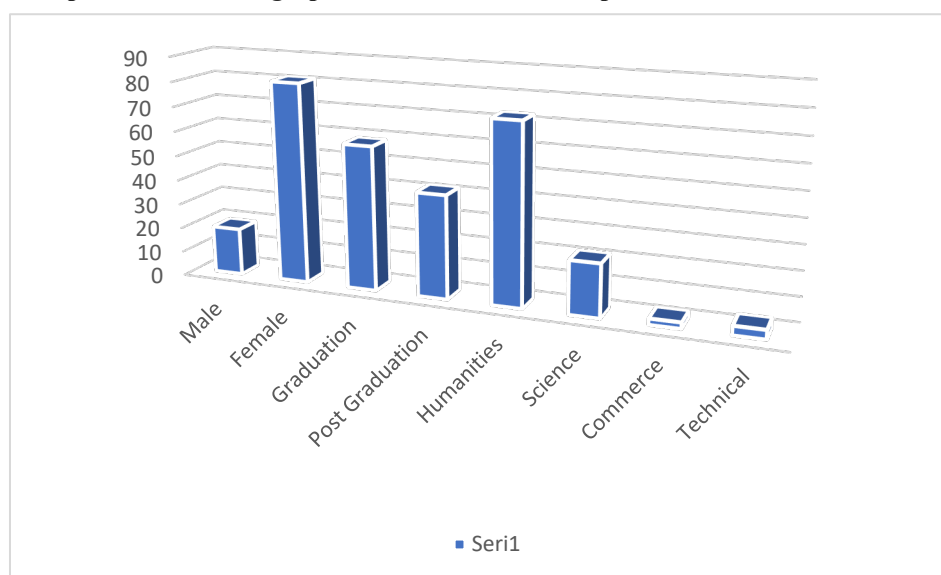
1.From the given table and figure it can be interpreted that out of 84 respondents 19% respondents were males and 81% respondents were females

2.The education level of the students were Graduation (58.3%) and post-Graduation (41.7%)

3.ln this study data was collected from the students of Guwahati city from different backgrounds. The education backgrounds of the respondents were Humanities (72.6%), Science (21.4%), Commerce (2.4%), and Technical (3.6%). lt can be interpreted that most of the respondents are from Humanities background.

Table 2 Analysis of the first objective
i)To study the student's perspective on effectiveness of online learning.
Tabular representation of objective number one "Student's perspective on effectiveness of online learning"

Statements	Responses N (%)
Student's perspective on effectiveness of online learning	
1.Have you ever participated in online learning?	Yes 84(100) No -
2. Which platform are you using for online learning? (You can select multiple options)	Zoom 28(33.3) Google Meet 81(96.4) YouTube 27(32.1) Other 13(15.5)
3. What gadget do you use for the practice of online learning?	Mobile 79(94) Tablet - Laptop 4(4.8) Desktop 1(1.2)
4. Which type of learning do you prefer?	Online 9(10.7) Offline 75(89.3)
5.Do you prefer online class?	Yes 29(34.5) No 55(65.5)
6. Why do you prefer online learning?	Easy access 20(23.8) Time saving 17(20.2) Flexible 28(33.3) Others 3(3.7)

7.What problems do you encounter to attend online class?

Lack of device availability at home   -
Lack of internet connection 40(47.6)
Lack of technological knowledge 2(2.4)
Lack of motivation 38(45.2)
Others 4(4.8)

8.Rate your understanding level of the topics during online class	Excellent 3(3.6)
	Good 24(28.6)
	Average 53(63.1)
	Poor 4(4.8)

9.Do you experience stress attending the online classes during the time of
 COVID-19 pandemic?

Yes 23(27.4)
No 8(21.4)
Partially yes/no 43(51.2)

10.Do you think online learning has made teaching learning process
easy?

Yes 56(66.7)
No. 28(33.3)

11. Do you think online learning increases learner's engagement in learning?   Yes 25(29.8)
No 59(70.2)

12 .Do you think online learning is essential during COVID 19 pandemic?   Yes 84(100)
No –

13.Has online learning fully satisfied your learning objectives?   Yes 5(6)
No 29(34.5)
Partially yes/no 50(59.5)

14.Do you think Online learning help you to comprehend the course material   Yes 10(11.9)
compared to offline classroom learning?   No 32(38.1)
Partially yes/no 42(50)

15.Overall, online learning is the best learning experience you have ever had   Yes 11(13.1)
No 29(34.5)
Partially yes/no 44(52.4)

Graphical representation of first objective (Statement 1 to 5)
Title: Student's perspective on effectiveness of online learning
Figure :2

Graphical representation of first objective (Statement 6 to 8)
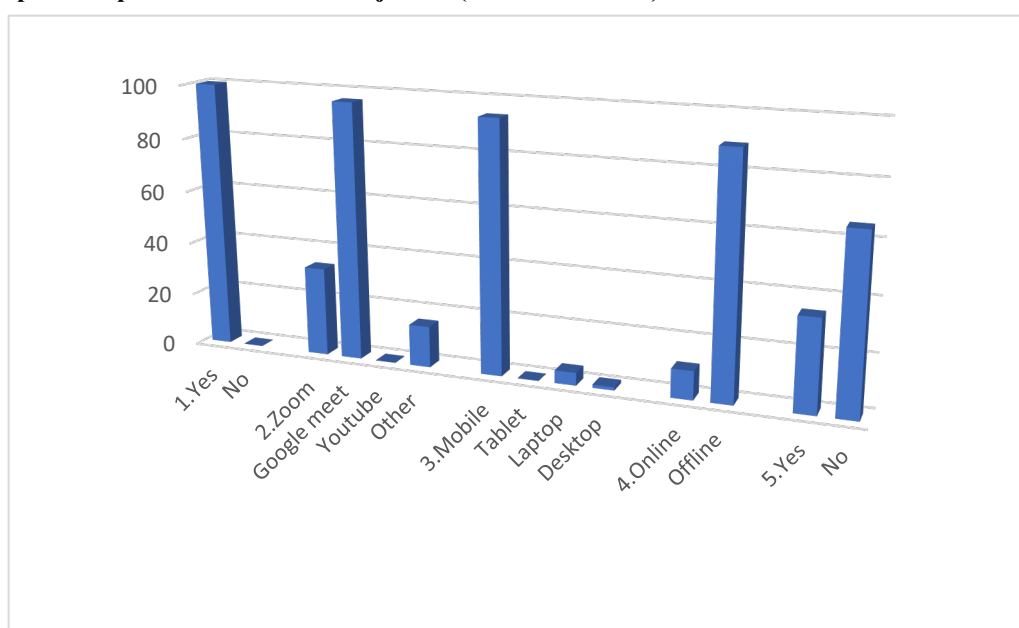
Title: Student's perspective on effectiveness of online learning

Figure:3
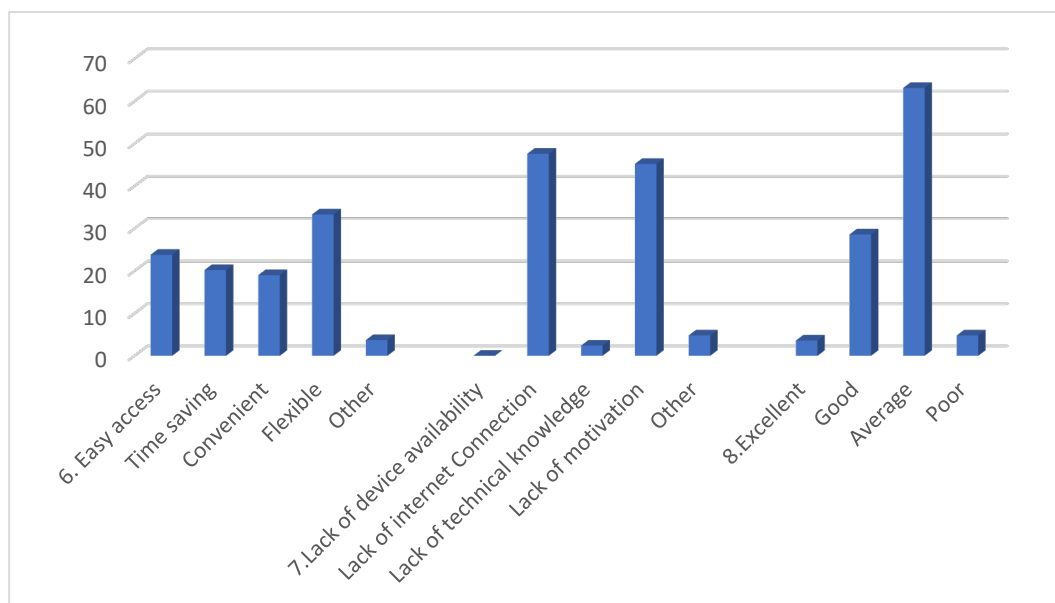
Graphical representation of first objective (Statement 9 to 15)
Title: Student's perspective on effectiveness of online learning
Figure:4

Interpretation of first objective: Student's perspective on effectiveness of online learning:
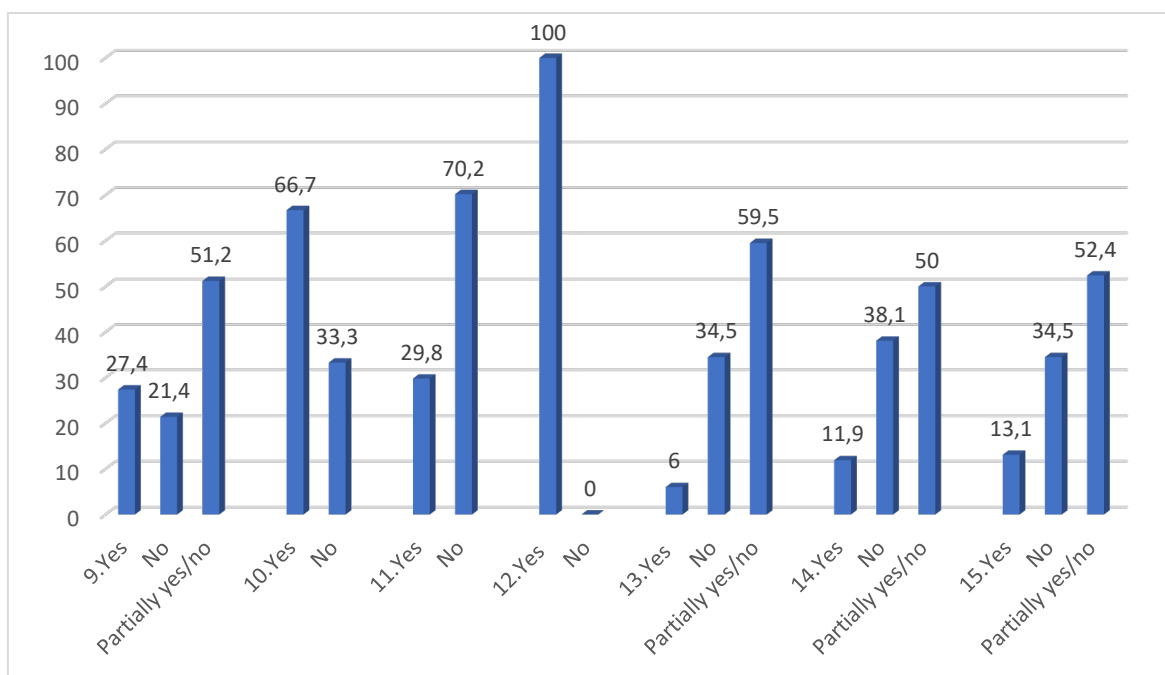
1. From the given tables and figures, it can be clarified that 100% of the respondents participated in online learning.

2. 33.3% of the respondents are using zoom platform, Google meet 96.4%, YouTube 32.1% and 15.5% of the respondents were using other platforms for online learning.

3. Majority of the respondents use mobile device for the practice of online learning. Whereas Laptop, desktop devices are used by. 4.8% and 1.2 %of the respondents respectively

4. 10.7% from the respondents preferred online learning, whereas majority of the respondents 89.3% prefer offline learning.

5. 34.5% of the respondents reported that they prefer online classes whereas 65.5 %of the respondents do not prefer online classes.

6. 23.8%of the respondents stated that they prefer online due to its easy access. Whereas,20.2% of the respondents prefer it due to its time saving nature. Majority of the respondents 33.3% prefer online learning due to its flexibility.

7. 47.6% of the respondents stated that lack of internet connection is a problem they encounter to attend online classes.2.4% of the respondents selected lack of technological knowledge and 4.8% of the respondents encounter other problem such as lack of interest, lack of teacher student interaction to attend online classes. Whereas majority of the respondents stated that lack of motivation 45.2 as one of the problems they encounter to attend online classes.

8. 3.6%of the respondents rated excellent on their understanding level of topics during online classes. Whereas 28.6% of the respondents rated good and 4.8% rated poor. Majority of the respondents 63.1% rated average on their understanding level of topics during online classes.

9. 27.4% of the respondents stated that they feel stressed attending online classes during COVID-19pandemic.21.4% of the respondents do not feel stressed. Whereas majority of the respondents 51.2% selected partially yes/no.

10. 66.7%of the respondents think that line learning has made teaching learning process easy. Whereas 33.3% of the respondents do not think so.

11. 29.8%of the respondents that that online learning increases learner's engagement in learning. Whereas 70.2% of the respondents do not think so.

12. 100% of the respondents think that online learning is essential during the time of COVID 19 pandemic.

13. 6% from the respondents were of the opinion that online learning fully satisfied their learning objectives.34.5% from the respondents were of the opinion that online learning did not satisfy their learning objectives whereas 59.5 % stated partially yes/no regarding the statement.

14. 11.9%of the respondents think that online learning helps them to comprehend the course material compared to offline learning classroom whereas 38.1% of the respondents do not think so.50%of the respondents selected partially yes/no.

15. According to the 13.1% of the respondents, online learning was the best learning experience they have ever had.34.5%of the respondents do not think so. Whereas 52.4% of the respondents selected partially yes/no regarding the statement.

Table 3. Analysis of second objective
1.To study the benefits and drawbacks of the mode of online learning from the perspective of students.

Tabular representation of objective number two "to study the benefits and drawbacks of the mode of online learning from the perspective of students".

Statement	N (%)
16.Benefits of online learning	
Responses	
Learning on your own pace.	48(57.1)
Easy to do classes from home	67(79.8)
Ability to record meeting and study materials for further help.	46 (54.8)
Flexible schedule and convenience.	35(41.7)
Access to online materials.	32(38.1)
Other.	–

17.Drawbacks of online learning	N (%)
Responses	
Reduce physical contact between teacher and friend	69(82.1)
Technical issue	60(71.4)
Lack of technical resource.	26(31)
Heterogenous timetable.	32(38.1)
Lack of motivation and self-discipline	60(71.4)
Other.	1(1.2)

Graphical representation of second objective (Statement 16 to 17)
Title: To study the benefits and drawbacks of the mode of online learning from the perspective of students.

Figure :5
Interpretation of second objective: To study the benefits and drawbacks of the mode of online learning from

Legend:
- 16.Learning on your own pace
- Easy to do classes from home
- Ability to record meeting and study materials for further help
- Flexible schedule and convenience
- other
- 17.Reduce contact between teacher and friend
- Technical issue
- Lack of technical resource
- Heterogenous time table
- Lack of motivation and self discipline
- Other
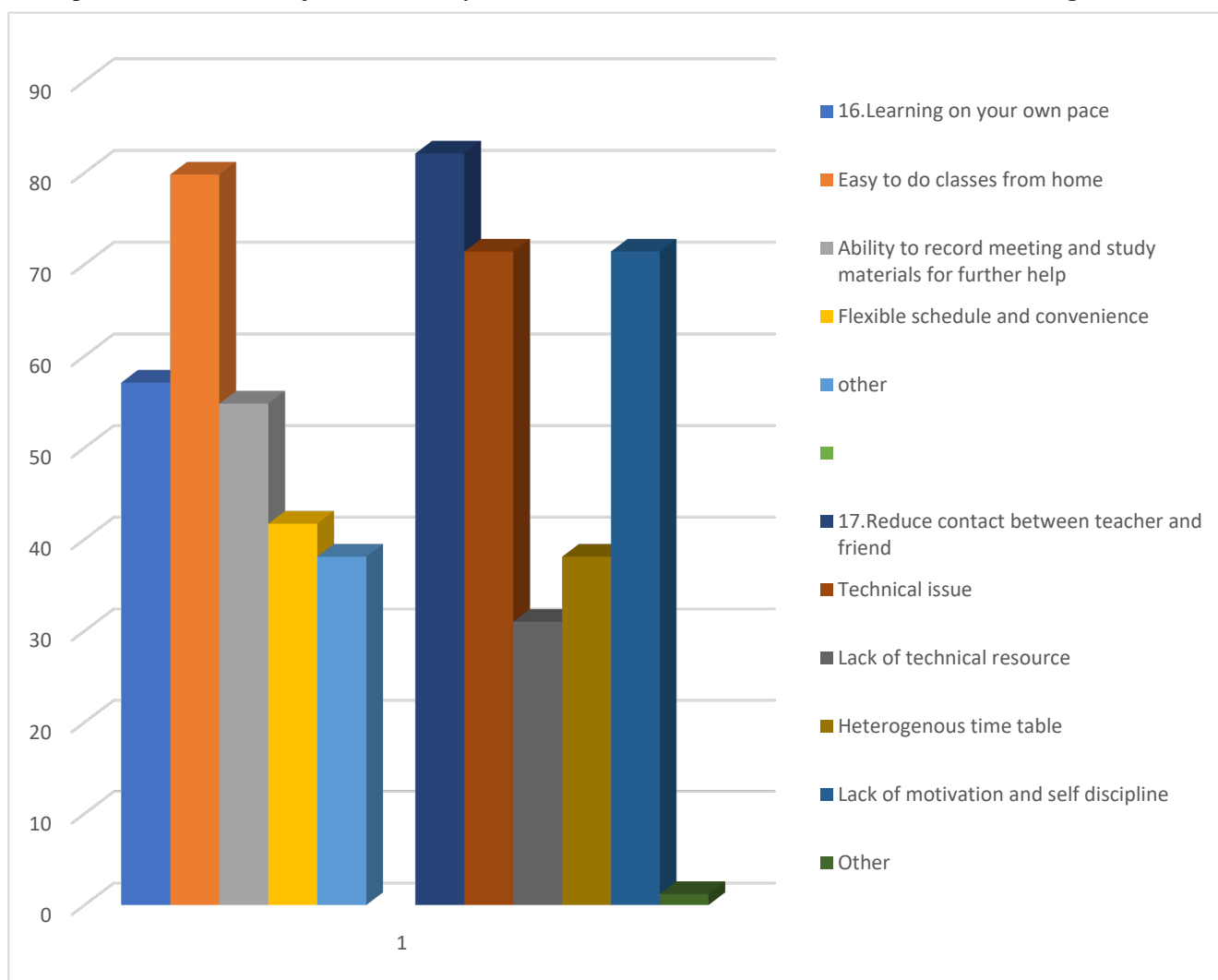
the perspective of students:
1. From the above given table and figure it can be interpreted that 57.1 % from the respondents selected ability to learn at one's own pace as one of the benefits of online learning followed by easy to do classes from home (79.8%), ability to record meetings and study materials for further help (54.8%), flexible schedule and convenience (41.7%), and the access to online material (38.1%)

2. Regarding drawbacks of online learning, majority (82.1%) found it difficult due to reduced physical contact between teachers and friends, followed by technical issues and   Lack of motivation (71.4%), Heterogenous time table (38.1%) and lack of technical   resources (31%).

Table 4. Analysis of third objective
iii)To know the motivation level among students using online learning.
Tabular representation of objective number three to "know the motivation level among students using online learning"

Statement	Responses N (%)		
	Agree	Undecided	Disagree
motivation level among students using online learning			
18.I enjoy getting information through online learning.	31(36.9)	39(46.4)	14(16.7)
19.Online learning provides me different learning styles and can make my learning more fun	37(44)	33(39.3)	14(16.7)
20.l think l am more engaged in my online learning than that of offline.	10(11.9)	28(33.3)	46(54.8)

21.l feel anxious during online classes.   24(28.6)   34(40.5)   26(31)
22.l think online learning environment is not inherently   46(54.8)   30(35.7)   8(9.5)
 motivating
23. l do not feel motivated to join in online classes   42(50)   26(31)   16(19)
24. l think online learning makes the participant less active   69(82.1)   10(11.9)   5(6)
than the offline learning
25. l get easily distracted and have difficulty concentrating   60(71.4)   16(19)   8(9.5)
 during online classes
26.Online classes has encouraged me to develop my own   24(28.6)   38(45.2)   22(26.2)
academic interest as far as possible
27.l am always eager to learn how to use e-learning resources 59(70.2)   22(26.2)   3(3.6)
28.Lack of technical skills make me uncomfortable during   31(36.9)   21(25)   32(38.1)
 online classes.
29.Online learning generally creates more problems than it.   37(44)   37(44)   10(12)
 solves.

Graphical representation of third objective (Statement 18 to 23)
Title: To know the motivation level among students using online learning"
Figure:6
Graphical representation of third objective (Statement 24 to 29)
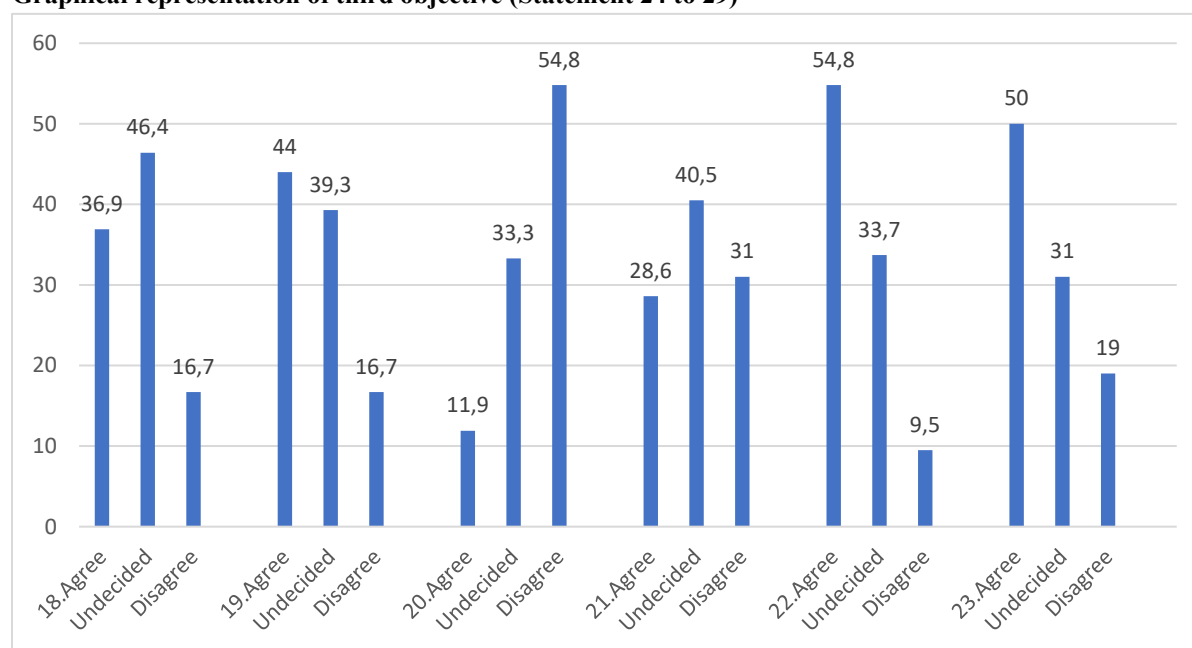
Title: To know the motivation level among students using online learning

Figure: 7
Interpretation of third objective: To know the motivation level among students using online learning
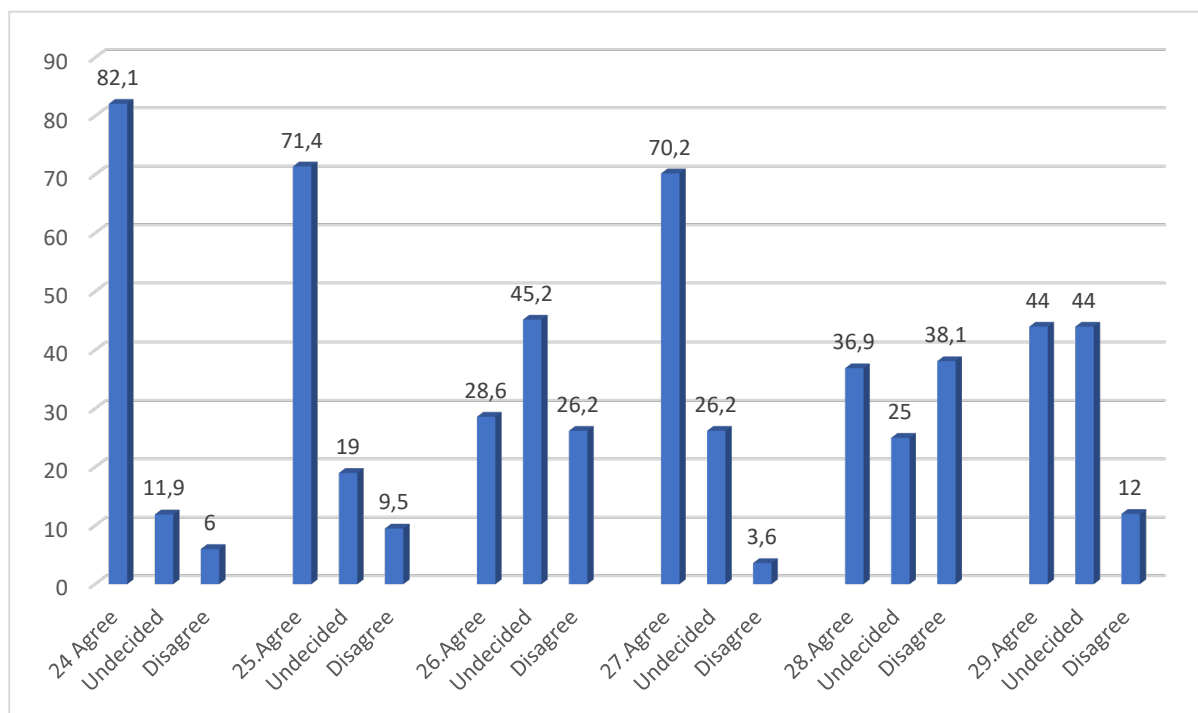
1. From the given tables and figures it can be interpreted that 36.9 % of the respondents agreed that they enjoy getting information through online learning and 16.7% from the respondents disagreed whereas 46.4% of the respondents were undecided regarding this statement.

2. 44% respondents agreed that online learning provides different learning styles and can make their learning more fun.39.3% of the respondents were undecided regarding the statement. Whereas 16.7%of the respondents do not agree with the statement.

3. 11.9% respondents agreed that they were more engaged in online learning than that of offline learning, 33.3% of the respondents were undecided whereas 54.8% disagreed that they were more engaged in online learning than that of offline learning.

4. 28 6% of the respondents agreed that they feel anxious during online classes,40.5% of the respondents were undecided with the statement. Whereas 31% from the respondents disagreed with the statement.

5. 54.8% of the respondents agreed that online learning environment is not inherently motivating.35.7% respondents were undecided whereas 9.5% of the respondents disagreed with statement.

6. 50%of the respondents agreed that they do not feel motivated to join in online classes.31%of the respondents were found to be undecided. Whereas 19% of the respondents disagreed with the statement.

7. 82.1 %of the respondents think that online learning makes the participants less active than that of offline learning.11.9% of the respondents found to be undecided regarding the statement whereas 6% of the respondents do not think so.

8. 71.4% of the respondents agreed that they get easily distracted and had difficulties concentrating during the time of online classes,19% of the respondents were undecided with the statement. Whereas 9.5 % of the respondents disagreed with the statement.

9. 28.6 % of the respondents agreed that online classes had encouraged them to develop their own academic interest as far as possible.45.2% of the respondents found to be undecided regarding the statement whereas 26.2% respondents disagreed with the statement.

10. 70.2% of the respondents agreed that they are always eager to learn how to use e -learning resources.26.2% of the respondents were undecided with the statement .3.6%disagreed with the statement.

11. 36.9%of the students agreed that lack of technical skills make them uncomfortable during online classes.25%of the respondent were undecided with the statement whereas 38% of the respondents disagreed with the statement that lack of technical skills make them uncomfortable during online classes.

12. 44% from the respondents agreed that online learning generally creates more problems than it solves.44% of the respondents were found to be undecided regarding the statement. Whereas 12% of the respondents disagreed with the statement.

Findings of the study:

The major findings of the study are as follows:

<u>With regard to objective one the major findings are:</u>

1.   It was found that 100% of the respondents participated in online learning. Majority of the respondents are using Google meet (96.4%) platform for online learning. Majority of the respondents (94%) use mobile device for the practice of online learning. Whereas Laptop, desktop devices are used by. 4.8% and 1.2 %of the respondents respectively.

2.   89.3% prefer offline learning whereas 10.7% respondents were of the opinion that they prefer online learning.

3.   Majority of the respondents 33.3% prefer online learning due to its flexible nature followed by 23.8%of the respondents who prefer online due to its easy access. lt was also found that 47.6% of the respondents stated that lack of internet connection is a problem they encounter to attend online classes. Whereas majority of the respondents 45.2%stated that lack of motivation as one of the problems they encounter to attend online classes.

4.   28.6% of the respondents rated good on their understanding level of topics during online classes whereas 63.1% rated average on their understanding level of topics during online classes. 27.4% of the respondents stated that they feel stressed attending online classes during the time of COVID-19 pandemic. 66.7% respondents think that online learning has made teaching learning process easy.

5.   70.2% of the respondents do not think that online learning increases learner's engagement in learning .100% of the respondents think that online learning is essential during the time of COVID 19 pandemic.

6.   According to 34.5% respondents, online learning did not satisfy their learning objectives whereas 59.5 % stated partially yes/no regarding the statement.11.9%of the respondents think that online learning helps them to comprehend the course material compared to offline learning classroom whereas 38.1% of the respondents do not think so.50%of the respondents selected partially yes/no.

7.   It was also found that 13.1% of the respondents were of the opinion that online learning was the best learning experience they have ever had.34.5%of the respondents do not think so.

With regard to second objective the major findings are:

1.   With regard to the benefits of online learning majority of the respondents, 79.8% selected   easy to do classes from home, followed by ability to learn at their own pace 57.1%, ability to record meetings and study materials for further help (54.8%), flexible schedule and convenience (41.7%).

3.   Regarding drawbacks of online learning, majority (82.1%) found it difficult due to reduced physical contact between teachers and friends, followed by technical issues and   Lack of motivation (71.4%), and lack of technical resources (31%).

With regard to third objective the major findings are:

1.   It was found that 36.9 % of the respondents agreed that they enjoy getting information through online learning. Majority of the respondents, 44% agreed that online learning gives different learning styles and it can make their learning more fun. 54.8% disagreed with the statement that they are more engaged in online learning than that of offline learning.

2.   28. 6% of the respondents agreed that they feel anxious during online classes, whereas 40.5% respondents were undecided with the statement. Whereas 31% respondents disagreed with the statement. lt was also found that 54.8% agreed that online learning environment is not inherently motivating. Majority of the respondents 50% agreed that they did not feel motivated to join in online classes.

3.   It was also found that 82.1 %of the respondents think that online learning makes the participants less active than that of offline learning. This is may be due to the lack of motivation, physical classroom interaction among the learners. Majority of the respondents 71.4% agreed that they got easily distracted and have difficulties concentrating during the time of online classes.

4.   28.6 % of the respondents agreed that online classes had encouraged them to develop their own academic interest as far as possible. Whereas most of the respondents 45.2% found to be undecided regarding the statement .70.2% of the respondents agreed that they are always eager to learn how to use online learning resources.

5.   It was also found that, 36.9% respondents agreed that lack of technical skills make them uncomfortable during online classes. whereas 38% of the respondents disagreed with the statement. It was also found that 44% of the respondents agreed that online learning generally creates more problems than it solves.

Suggestions:

The objective of the study was to get an understanding of student's perspective on effectiveness of online learning. As per the present study, it is clearly observed that majority of the students (89.3%) do not prefer the mode of online learning as they prefer offline mode. Majority of the respondents rated average on their understanding level of topics during online classes. To make online mode of learning understanding and interesting teacher should encourage students to ask for direct and honest feedback covering everything from content to teaching methods. ln this way teacher can clarify student's doubts and can make online teaching learning process effective and fruitful.

While receiving online learning, students gained both positive and negative experiences although their experiences tended to more negative. Flexibility to attend classes, easy access, time saving nature contributed to participants' positive experiences as these are the benefits of online learning. lt has various benefits. Online mode of learning is rapidly becoming one of the popular medium to provide education. ln today's rapidly changing world with technological advancements digital education should be encouraged along with offline teaching learning mode.

Regarding the drawbacks of online learning majority of the respondents (82.1%) found it difficult due to reduced physical interaction followed by technical issue and lack of motivation. Developing positive attitudes towards online learning can help students overcome some potential challenges possessed by online learning such as remain focused during online classes etc. Students can take opportunities to engaged with fellow learners during online discussions or group activities. Another major drawback of online learning is technical issue, while internet connectivity has been growing over the past few years in smaller cities and towns, a good internet connection with regular speed is a problem because without a good internet connection, both the students and teachers cannot continue online learning smoothly.

Majority of the respondents agreed that they enjoy getting information through online learning. Majority of the respondents (44%) were of the opinion that online learning provides different learning styles and make learning more fun. Majority of the respondents also agreed that they are always eager to learn how to use e -learning resources. Online learning should be encouraged among students because it provides certain benefits like flexibility, learning at one's own pace, time saving and easy access.

Students in this study also agreed that they did not feel motivated to join in online classes. They also agreed that online learning makes the participant less active than that of offline learning. Most of the respondents agreed that lack of technical skills make them uncomfortable during online classes. From the findings it is evident that while some of the students are motivated to get education through online mode of learning but majority of the respondents do not feel motivated enough to join in online learning due to drawbacks of online learning such as lack of interaction, self-motivation, lack of technical skills etc. These problems can be solved through structured online learning classes where the problems of students can be solved through mutual interaction between the teacher and learner. Periodic feedback, assisting students when they encounter any technical problems, delivering organized contents. Teacher can also encourage students to involve in various activities such as webinars, projects, workshops etc. using e-learning methodologies to create awareness, interests and understanding about e-learning.

Conclusion:
E -learning has ample prospects to provide firm support to all types of academic tasks. Teaching-learning process, now-a-days is no longer limited to its traditional boundaries or ways and means. lt has gradually become a subject of technical progress. E-learning is the demand of the time. ln this rapidly moving world, students can be able to sustain only by making themselves capable of moving with the time and technological progress. Online mode of learning is becoming more and more a part of education system worldwide. Online mode of learning makes education convenient and easily accessible by one and all.

The present study was conducted to get an understanding of student's perspective on effectiveness of online learning. This study tries to discover the perspective of students on effectiveness of online learning, its benefits and drawbacks and motivation level among students using online learning. As per the study it is clearly observed that most of the respondents do not prefer online mode of learning as they prefer offline mode. Most of the respondents rated average on their understanding level of topics during online classes. Majority of the respondents (34.5%) agreed that online learning did not satisfy their learning objectives. While receiving online education students gained both positive and negative experiences. According to the respondent's flexibility to attend classes, easy access, time saving nature, are the few benefits of online learning. On the other hand, lack of physical interaction, technical issues and lack pf motivation are few drawbacks of online learning.

From the findings of the study, it is evident that majority of the respondents (100%) think that online learning is essential during the time of covid -19 pandemic. lt was found that some of the students are motivated to get education through online mode of learning. But majority of the respondents did not feel motivated enough to join in online learning due to some of the drawbacks which comes with online learning. Due to the ongoing period of Covid -19 pandemic online mode of learning is much preferred as well as opted across the world to continue the teaching learning process in the educational institutions. Online learning is emerged as a powerful tool for achieving the goals of education. Research and exploration are continuous process. Therefore, more research needs to be done in this field so that new things emerge and contribute in the field of online learning.

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TECHNOLOGICAL KNOWLEDGE OF RESEARCH SCHOLARS AND THEIR PROBLEMS IN USING ICT IN BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

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ABSTRACT

The revolution in information and communication technology is ruling the globe, and it has an important role in the developing countries like India. ICT helps the scholars to build their ICT skills and help them to learn through computer assisted learning. The main objective of the study is to examine the technological knowledge of research scholars in Higher education and research. This paper employs quantitative approach to find out the technological knowledge of research scholars and their problems in using ICT. According to the study's findings, 112 (78.8%) scholars recommends digital library facility and 106(74.6%) recommends automation of Library. 114 (80.2 %) respondents said they would use internet to download e-resources, 27 (19 %) said they would go online shopping, and 120 (84.5 %) said they would prepare assignments. 87(61.2%) faced reliability problem and 142(100%) faced physical strain while using ICT services.
Keywords: Internet Use, E- resources, Digital Library, Search Engine, Research Scholar

INTRODUCTION

The information and communication technology in education was launched in India before two decades. The amount to which ICT systems are used, the speed with which they are accessed, and the competence with which they are applied determines a country's progress. Internet connectivity should be provided to all research scholars free of cost to ensure that their learning process is not affected. The use of ICT should enhance and help researchers in their academic purpose. Nowadays all the countries employ ICT to sustain in this competitive global market. Information and Communication Technologies (ICTs) are now widely acknowledged as having a ubiquitous impact on the research in education. Since the advent of the moveable type printing techniques, information and communication technology is largely regarded as the greatest significant change that humanity has seen. Worldwide research proved that students who have technological knowledge had more innovative capabilities than the students who are not exposed to technology.

RELATED LITERATURES

Jabbar, Saqib, and Muhammad (2020) explored a study on how research scholars accessed and used the Institutional Repository (IR). It also looked into differences in opinion based on participants' gender, age, and educational background. In addition, the necessity for training and supervision in order to make good use of IR has been included. A questionnaire-based survey was used to collect data from M.Phil. and Ph.D students in seven departments at the COMSATS Institute of Information Technology in Lahore. The findings revealed that research scholars only use IR on a limited basis and have restricted access to the publications. They have accessed the IR in order to do their tasks. They stated that they require substantial training in order to effectively employ IR. They stated that they require substantial training in order to effectively employ IR.

Ansari (2020) investigated on the use and awareness of E-resources among research scholars of Literature Subjects in Banaras Hindu University. The study's main objective was to determine how well users are aware of accessible

e-resources. An online questionnaire was designed for this purpose and distributed to 100 Research Scholars of the literary subjects. According to the survey the majority of respondents are aware of the features of e-resources. They are aware that e-resources are available online and provide creative ways to search for information based on the requirement. The research also highlighted that the most serious issue is a lack of technical knowledge.

Amanullah, Banoo, and Khiste (2019) focused on instructors' and researchers' experiences using the E-database of Kashmir University's Allama Iqbal library. The main objective is to find out the use of Library e-resources by research scholars and faculty members. This study was conducted with the help of a well-designed questionnaire and discovered that there has been a significant increase in the use of databases, that users' attitudes toward e-resources are positive, and that the majority of the "time spent" by users in the library is spent by interacting with the available e-databases. Slow internet access is a key issue for the majority of (85.7%) teachers and (62.8%) research scholars.

Shanmugam, and Shanmugamoorthy (2016) conducted a study on the role of ICT in Information Seeking and use amongst research scholar in Higher Education. The purpose of this study was to determine the knowledge of students, research scholars and faculty members from ten institutions. The data was collected from PG students, Research Scholars, and Faculty members of 10 colleges of Bharathiar University using a well-structured questionnaire. The survey approach is used among PG students, research scholars, and employees. It was found that out of the total 1561 respondents, 223 (14.29%) respondents claimed that they access current information, 242 (15.50%) respondents indicated improved professional competence, 387 (24.79%) respondents indicated easier and faster access. 266 (17.04%) respondents indicated wider information access and 443 (28.38%) respondents indicated expedited research and academic process.

Siddiquah and Salim (2017) investigated on the ICT facilities, skills, usage, and the problems faced by the students of higher education. The objective of this research is to investigate ICT facilities, skills, usage, and challenges encountered by higher education students when utilising ICT. The population of the study consisted of 250 students from public sector universities in Lahore, Pakistan. The data was analyzed using descriptive statistics. According to thefindings, students have computers and Internet access at home and at their colleges. They are proficient in basic skills such as MS Word, Power Point, Internet Searching and Browsing, Social Networking and Email, but are less skilled or incompetent in others such as using a digital library, discussion forums, and blogs. They feel that using ICT aids their learning. The majority of students confront issues such as slow computer speeds, Internet signal problems, malware threats, load shedding, and a lack of Internet access. Universities must invest more in developing infrastructure in order to alleviate ICT-related issues faced by students.

OBJECTIVES OF THE STUDY
The study's major objective of this study was to examine the technological knowledge and its use by research scholars. This study aims to investigate the following objectives:
• To investigate the role of technology in research.
• To assess the use of technology by Research Scholars.
• To examine the technological knowledge of research scholars in Higher education and research.
• To find out particular variables that has hampered research scholar's usage of ICT services.

METHODOLOGY
A questionnaire was designed after conducting a comprehensive review of the related literature. The survey method was used to collect the data from the scholars. 168 research scholars of Bharathidasan University, Tiruchirappalli were selected for the study and questionnaire was distributed among them and only 142 questionnaires were returned completed.

DATA ANALYSIS AND DISCUSSION

a) Use of Computer by Research Scholars
The present condition of computer use by scholars is encouraging. 52% of the scholars use computer on a daily basis, 31% on a weekly basis, and only 17 % on a monthly basis. In one way or other way all were found using

the computer for their research work. Although students believe computers are an important aspect of higher education and research, they use it rarely.

b) Use of Internet by Scholars

All research scholars use the Internet. The table summarizes the reason for using internet.

Table 1: Purpose and frequency of using the Internet

Purpose	Frequency	Percentage
Research purpose	129	90.8%
Download E -resources	114	80..2%
Prepare Assignments	120	84.5%
E-mail	132	92.9%
Online shopping	27	19%
Playing games	28	19.7%
Chatting	52	36.6%

From the above table it was found that majority of research scholars use the internet for research purposes, 114 (80.2 %) scholars said they use it for downloading e-resources, 104 (79.39 %) said they use it for preparing assignments, 132 (92.9 %) said they use it for email, 23 (17.56 %) said they use it for online shopping, 25 (19.08 %) said they use it for playing online games and 49 (37.40 %) scholars said they use it for chatting.

c) Need for ICT assisted library

Research Scholars recommended few ICT facilities needed for them to do their research.

Table 2: ICT facilities recommended by Research Scholars

ICT facilities	Frequency	Percentage
E - Resources	107	75.3%
Digital library facility	112	78.8%
Library websites	103	72.5 %
Automation of library	106	74.6%
Local Area Network for library	116	81.6%

The table above explores the ICT facilities proposed by the research scholars. 75.3% of the scholars recommended for remote access to all e- resources and services. 72.5 % of respondents said they would recommend a library website, and 74.6% said they would advocate library automation. 81.6% of research scholars advocated local area network for the library.

d) ICT Literacy of Research Scholars

Table 3 : Technological Knowledge of Research Scholars

ICT tools and applications	Familiar	Quite Familiar	Not Familiar
Keyboard	86 (60.5 %)	50 (35.2%)	6 (4.2 %)
Internet	77 (54.2 %)	54 (38.0 %)	11 (7.7 %)
E-mail	96 (67.6 %)	42 (29.5 %)	4 (2.8 %)
Printer	70 (49.2 %)	63 (44.3 %)	9 (6.3 %)

Google Meet	64 (45.0 %)	55 (38.7 %)	23 (16.1 %)
MS Word	93 (65.4 %)	46 (32.3 %)	3 (2.1 %)
Excel	47 (33.0 %)	55 (38.7 %)	40 (28.1 %)
PowerPoint	92 (64.7 %)	32 (22.5 %)	18 (12.6 %)

From the table above, it is found that most of the 142 research researchers feel comfortable using the keyboard. 11(7.7%) are not familiar how to use Internet in a proper way. 96(67.6 %) of scholars are comfortable using the email. Surprisingly, 9(6.3%) research researchers are still unsure how to use the printer. 23(16.1%) are not sure how to use Google Meet. Only 3(2.1%) of scholars are not familiar in using MS Word and 40(28.1%) are unsure how to use Excel tool. Almost all the scholars are well versed in using the power point tool.

e) Preferred search engines

Table 4 : Search engines preferred by Research Scholars

Preferred Search engine	Frequency	Percentage
Google	142	100%
Microsoft Bing	75	52.8%
Yahoo	97	68.3%
Scirus	49	34.5%
Iseek	38	26.7%
Yandex	37	26.0%

It is evident from the above table, that Google was the most commonly utilized search engine by the research scholars, with a response rate of 100%. 68.3% scholars used Yahoo and 52.8% scholars used Bing for searching the web. Scirus, iseek, and Yandex are the other search engines, used by the research scholars.

f) Problems in using ICT
There are numerous issues with ICT usage. As a result of this realisation, data was gathered to determine the numerous issues faced by research scholars, which were then listed below.

Table 5 : Problems faced while using ICT services

Problems in using ICT	Frequency	Percentage
Reliability	87	61.2%
High Cost	110	77.4%
Electricity problem	117	82.3%
Slow internet speed	80	56.3%
Unable to access full Test	46	32.3 %
Finding relevant information	54	38 %
Physical Strain	142	100 %
Mental Strain	140	98.5%

From the table above, it is evident that Physical and mental strain were the most common reasons for not using ICT services. Other major problems faced by research scholars are reliability, electricity problem, high costs, slow internet speed with answer rates of 61.2%, 82.3%, 77.4% and 56.3% respectively. 32.5 % scholars were unable to access full test because it's too costly in some websites. 38% scholars find difficult to get relevant information needed for their study.

MAJOR FINDINGS

➢ Based on the analysis of data collected, it is clear that the majority of Bharathidasan University scholars have excellent knowledge of ICT-based services that they using it daily, which is a positive sign for the research environment. According to the respondents, research will not be productive unless ICT tools and techniques are incorporated in the research process.

➢ 80.2 % of respondents suggested using an e-resource for their research work. Computer is used by 50 % of people on a daily basis, another 31% on a weekly basis, and just 19 % on a monthly basis.

➢ In terms of Internet use, 100% of respondents said they utilise it. 129 (90.8 %) of research researchers stated that they utilise the internet for their research purpose. 114 (80.2 %) respondents said they would use internet to download e-resources, 27 (19 %) said they would go online shopping, and 120 (84.5 %) said they would prepare assignments.

➢ In terms of an ICT facility recommended by a research scholar, e-resource enabling remote access to library materials and services was recommended by 107 out of 142 respondents. A library website is recommended by more than 103 (72 %) of respondents. 112 (78.8 %) scholars recommended digital library facility and 106 (74.6) scholars recommended automation of library.

➢ 54.2% scholars are comfortable using the internet and 67% scholars are familiar in using email, and the majority of 60.5% scholars are familiar with keyboard. 28.1 % Scholars lack confidence in their ability to use any Excel and 12.6 % scholars are not confident in using PowerPoint tool.

➢ All the research scholars preferred Google as their preferred search engine. 68.3% scholars used Yahoo and 52.8% scholars used Microsoft Bing. The majority of respondents rated the influence of ICT tools and applications in research as excellent. When it comes to employing ICT services, there are a variety of issues to consider. The biggest issue with using ICT services was physical and mental exhaustion. The other major problems are high cost, reliability, electricity problem and slow internet speed.

SUGGESTIONS

This study found that ICT can be a great tool for addressing issues in educational research. According to this survey, the utilisation of ICT services by scholars is satisfactory. The university central library must take additional steps to enhance the use of ICT related library services by holding orientation programmes to scholars on how to utilize online databases, an automated library system, digital library, and an institutional repository. The University Central Library should also take steps to develop the library website more user-friendly by including links to various ICT-based library resources and services, as well as the construction of a digital library, institutional repository, and library blogs. The library should provide online full text service and video text service to all scholars who visit the library for research purpose. The university's central library should also take the lead in establishing innovative ICT based library services. The government also should take steps to provide free Wi-Fi facilities to all scholars so that they can use their computer without any hassle.

CONCLUSION

We are living in a digital world. ICT plays an important place in our day to day educational world transforming the whole educational system. Without technological knowledge no one can survive in the research field. ICT gadgets have made peoples life simple and informative. ICT have a significant potential in modernization of research in higher education. ICT tools should be implemented in educational institutions and training should be provided to all research scholars to develop their technological knowledge. ICT shows high impact on our educational practices. So it has become a must for all the research scholars and educationalist to have a complete knowledge about the ICT facilities and how to use it in the field of education. Modernization, updating facilities in education, and making capital investment in education will be more fruitful to the scholars who are interested in research work.

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ACKNOWLEDGEMENTS

A STUDY OF COMPLIANCE OF CORPORATE SOCIAL RESPONSIBILITY IMPLEMENTATION PRACTICES WITH RESPECT TO CSR PROVISIONS AS STATED IN THE COMPANIES ACT 2013 WITH SPECIAL REFERENCE TO LARGE-SCALE ORGANIZATIONS IN PUNE

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ABSTRACT
The Companies Act 2013, Sec.135 came into force on the first of April 2014,which brought major changes in the way CSR practices are implemented by organizations in India. The most important changes are the allocation of 2 % CSR funds, the compulsion to spend it through a CSR committee in accordance with Sec.135 of the Companies Act,the formation of CSR policy and compulsory CSR disclosures, etc.
This study aims to determine how large-scale organizations in Pune have implemented CSR in the post-CSR mandate period.(2017-18,18-19,19-20 & 20-21).Large-scale organizations in Pune are surveyed using a structured questionnaire.In addition to examining whether large-scale organizations' CSR policies comply with the Companies Act 2013, the survey assesses whether different aspects of an organization's CSR practices are relevant to its CSR policy, as stated in the law. This includes the content of CSR policy, composition of the CSR committee, creation of the CSR fund, implementation modalities, implementing partners, monitoring and performance assessment methods, roles and responsibilities of the Board of Directors and the CSR committee members, as well as the disclosure practices regarding CSR.The collected data is analyzed using SPSS software and MS-excel. Hypotheses testing is done using Pearson's Correlation Coefficient, Linear Modelling, MANOVA(Multivariate analysis of variance), and Paired Sample T-test.
According to key findings, most large-scale organizations in Pune are implementing CSR practices in accordance with Sec.135 of the Companies Act 2013. There is a high degree of compliance with Sec.135 of the Companies Act 2013 related to different CSR provisions in different organizations.
Keywords:CSR, Companies Act 2013, CSR implementation, CSR Committee

INTRODUCTION
A Conceptual Background
The business dictionary defines CSR as "An organization's commitment to the environment (both ecological and social) where it operates". "Failure of society makes it impossible for businesses to succeed"highlights the significance of Corporate Social Responsibility.

Abhijit Naskar (2020) stated that social progress begins with adopting a neighborhood, making its problems your own, and finding ways to solve them, also taking care of your neighborhood as if it was your own family will eventually lead the world to have enough individuals to handle all the problems of all the neighborhoods worldwide.

According to Campbell (2006)"An organization's CSR policy sets a minimum behavioral standard that aims to prevent harm to stakeholders and rectifies it as soon as it is identified".

India has a rich history of CSR ranging from charity and corporate philanthropy to present-daystrategic CSR.In terms of nominal GDP, India is the fifth-largest economy worldwide, and in terms of purchasing power parity, it is the third-largest.Being the second-largest populated country with a total population crossing the line of 1.4 billion, India is facing many socio-economic challenges. There is approximately one-third of Indians are illiterate, two-thirds are unable to access adequate sanitation, resultingin income and regional disparities to reduce which only government initiatives are inadequate.The Companies Act 2013, therefore, should be credited for being an important step in obtaining funding from the business sector to complement the government's social development goals programs, ensuring that the company contributes to the country's economic development in a fair and sustainable way.

REVIEW OF LITERATURE
The concept of CSR is deeply rooted in the global business agenda, but many barriers are required to beovercome for its effective implementation which involves informing stakeholders about CSR

by effectively referring to the mission, vision, and goals of the company and applying CSR at all stages of the company's operation, as stated by the author while evaluating the problems and difficulties experienced by Indian organizations while implementing CSR,Vandna Abuja (2013).

CSR is most effective when it is clearly defined and aligned with the existing policy framework and the vision and mission of an organization.The possibility for the Government of India to employ CSR strategically in the Indian context can be done by providing a favorable policy environment as stated in the concluding remarks. An Agenda for Sustainable Inclusive Growth by PHD Chamber of Commerce, New Delhi (2013).

While studying strategic corporate social responsibility at the Hindustan construction company, discovered that the CSR practices helped the business make more earnings, decrease accidents and reinforce relations with local communities,Mark Lee Hunter & Luk N. Van Wassanhove (2014).

Industries in India are undergoing changes, new customer value chains are evolving, and new models of collaborations are becoming popular.Organizationsneed to clearly define the purpose and the outcomes they want to the achieve in post CSR mandate era. They also stated that different organizations view CSR differently and organizations have three broad choices namely complier only, social license/equity builder&nation builders in CSR implementation,Boston Consultancy Group &NASSCOM Foundation (2015).

As stated in the CRISIL CSR yearbook, Indian companies are responding well to CSR mandates and private companies are spending more than public companies, while smaller companies are spending more than large ones. Education, health care, rural development, and environmental protection account for the majority of CSR expenditures. Compliance disparities were negligible across regions,Ramraj Pai, Nitesh Jain & Prabhash Choudhary (2015).

CSR was done in an unsystematic and partial way by most of the organizations selected for research. Most private companies preferred to spend CSR resources in fields such as education and community development. Government mandates and stakeholder expectations were the primary motivation behind doing CSR,Ramendra Singh, Madhupa Bakshi & Prashant Mishra (2015).

Government should formulate suitable policiesto implement CSR projects and suitable incentives should be paid to companies carrying CSR operations. The connection between macroeconomic policy and micro-level modifications should be identified by the corporate sector in order to initiate suitable CSR measures. CSR has been perceived positively by the Indian corporate sector, and their involvement in CSR initiatives has increased significantly,Barnabas & Vikram Philip (2016).

Poor enforcement of laws is destroying many countries' well-established legal systems, and one of the biggest examples of this is India, Tyagi (2021).

Research Gap: The CSR practices adopted by the Large scale organizations post-CSR mandate were studied by many researchers,but the compliance of Corporate Social Responsibility implementation practices with sec.135 of the Companies Act 2013 related to different aspects of CSRis not studied yet.

OBJECTIVES OF THE STUDY
1. To study the CSR Practices adopted by Large scale organizationspost-CSR mandate.
2. To study the compliance of Corporate Social Responsibility implementation practices with sec.135 of the Companies Act 2013.

RESEARCH HYPOTHESES
The following hypotheses are formulated for the study:
H1: CSR policy of the organization is in line with the Sec.135 of the Companies Act 2013
H2: Implementation of CSR practices is as per the CSR policy of the Organization

RESEARCH METHODOLOGY
Nature of Research:Quantitative Research. Because of the nature of the study, the currentstudy embraced the Descriptive researchdesign. This study is an effort to describe the CSR practices adopted by Large scaleorganizations in the post-mandate period.

Population for the Study: The Large-scale organizations in Pune from which the sample is to be selected are technically called Universe or Population. The population for this research is 147 Large Scale organizations in Pune.
Definition of the Population: All Large-scale Companies falling in Pune the region – including the Maharashtra Industrial Development Corporation (MIDC) areas in and around the geographical boundaries of Pune are considered as the population for the study.

Pune region consists of Pune City, Pimpri-Chinchwad, Hinjewadi, Talawade, Pirangut, Chakan, Rajagurunagar, Sanaswadi, Ranjangaon, Dehuroad, Talegoan, and Khed- Shivapur. All the Large-scale companies located in these places and are members of MCCIA, CII, and CSRBOX are considered as the population for the study.
Only one response has been obtained from one organization.

Characteristic of the Sample: Large-scale organizations in the Pune region, which falls under the purview of CSR mandate as per Sec.135 of the Companies Act 2013.

Sample Frame: It is a list of all those within a population who can be sampled. The number of Large scale organizations doing CSR keeps changing every year. The total figure is dynamic. Hence, the sample size has been determined based on an informed guesstimate of a number of companies, which has been obtained from MCCIA, CII, and CSRBOX. The sample frame includes the lists received from MCCIA, CII, and CSRBOX.

Sample Size: Sample size is determined using Krejcie and Morgan Table, with a 95 % confidence level and 5.04 % Margin of Error. A final sample of 106 companies is obtained. The sample was selected using the Convenience sampling method. The companies selected for the study are both listed and unlisted companies and represent diversified sectors such as engineering, Automobile, Banking, Finance, Consumer Durables, IT (Computer Software), and Oil &Gas.

Sampling Unit: CSR heads, CSR Committee members/Managers, Senior HR managers, AGM/Directors working as CSR heads/CSR Committee members.

Period of the Study: the study period includes CSR practices adopted by Large Scale
organizations in Pune infour financial years, namely F.Y.2017-18, F.Y.2018-19,
F.Y.2019-20 and F.Y. 2020-21 (Each financial year includes the period from 1st April to31st March).

Collection of Data: For collecting primary dataon corporate social responsibility, a survey was conducted using a structured questionnaire and a few face-to-face discussions were held. The secondary data was collected from reliable secondary sources such as Annual Company reports, CSR reports published oncompany websites, the National CSR portal, CSR, data from the industry by associations such as MCCIA, and CII, Reports of various Concerned Associations on CSR such as NAVAM and MCCIA, the CRISIL CSR yearbook,HandbookS on Corporate Social Responsibility from CII &PWC, Government websites and various newspaper articles.
Methods of Data Analysis and Statistical ToolsarePearson's Correlation Coefficientand Linear Modelling. MANOVA (Multivariate analysis of variance) and Paired Sample T-test.

Significance of the Study: This study helps to analyze and understand the level of compliance shown by Large scale organizations in Pune towards different CSR provisions as stated in Sec.135 of the Companies Act 2013.

DATA ANALYSIS AND INTERPRETATION
Reliability Test: The reliability data as indicated below shows the internal consistency of the questionnaire.

Table 1. Reliability Statistics

Cronbach's Alpha	N of Items
.954	96

As the value is .954 which is greater than .5, it shows that questionnaire is reliable and may be used for the collection of data.

Respondents Information –
 1. Type of Organization
It is about the type of organization represented by the respondents.

Table No.2: Type of Organization

Type of Organization	No. of Respondents	% of Respondents
Engineering	19	18
Banking	9	8
Manufacturing	16	15
Automobile	22	21
IT	14	13
Chemical	5	5
Food	4	4
Other	17	16

2. Organization Status
It is about whether an organization is under the falls under CSR mandate as per the act.

Table No.3: Organization Status

No. of Years	No. of Respondents	% of Respondents
Yes	99	93
No	6	6
Don't Know	1	1

Chart No.1: Organization Status

Companies under Purview of Sec.135 of Companies Act 2013
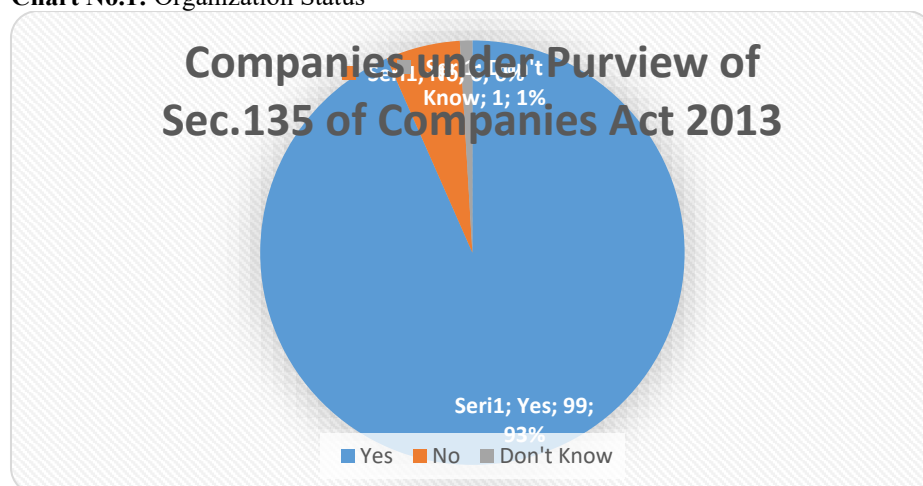
Interpretation: Based on the available responses, it can be stated that 93% of the organizations covered during the study fall under purview of Sec.135 of Companies Act 2013 while 6% of organizations do not and only one respondent is not aware about the CSR status of the organization.

3.   **Presence of CSR Policy**

Table No. 4.: Presence of CSR Policy

Responses	No. of Respondents	% of Respondents
Yes	99	93
No	7	7

Chart No. 2: Presence of CSR Policy
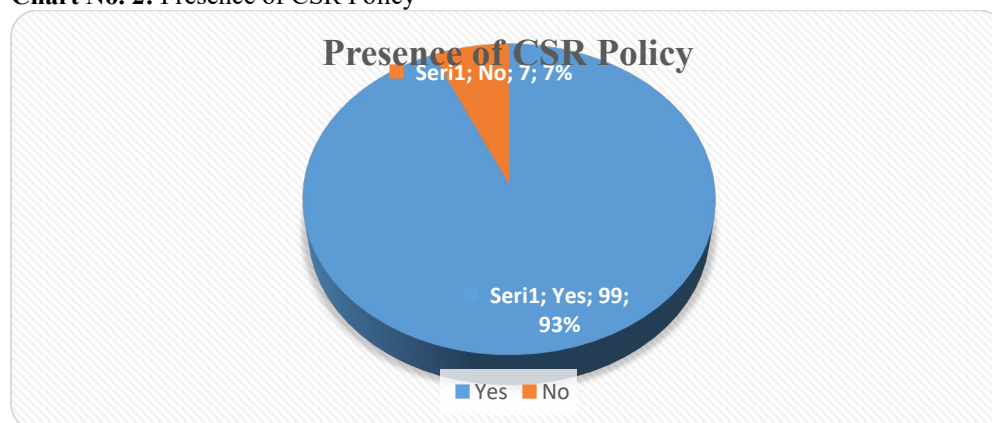
Interpretation: From the above graph, it can be stated that, as per respondents, 93% of the Large-scale organizations having a CSR policy in place while 7% not having a CSR policy.

Hypotheses Testing
Hypothesis 1: CSR policy of the organization is in line with the Sec.135 of the Companies Act 2013
Description of Variables
The variable which are identified are described in the table presented below.

Table No. 5: Description of Variables – Hypothesis 1

Sr. No.	Description of Variable	Variable Name
	CSR Policy	
1	Presence of CSR Policy	CSR1
2	Presence of CSR Committee	CSR2
	Sum of Average of values of variables related to CSR Policy	CSRAVG
	Organization and CSR Practices	
3	Socially responsible firm	CSRP1
4	The integration of CSR into an organization's business philosophy and strategic planning	CSRP2
5	Formulation of CSR policy as per provisions in New companies act 2013	CSRP3
6	Constitution of CSR Committee as per Sec.135 of Companies Act 2013	CSRP4
	Sum of Average of values of variables related to Organization and CSR Practices	CSRPAVG
	Functions of CSR Committee	
7	Inclusion of three or more directors and one independent director	CSRC1
8	Formation and recommendation of CSR policy to the Board	CSRC2
9	Recommendation of activities and the amount of expenditure to be incurred	CSRC3
10	Time to Time Monitoring of the CSR Policy of the company	CSRC4

	Sum of Average of values of variables related to Functions of CSR Committee	CSRCAVG
	Responsibilities of Board of Directors	
11	Formation a CSR committee	CSRB1
12	Approval for the CSR Policy	CSRB2
13	Ensuring implementation of the activities under CSR	CSRB3
14	Disclosure of the composition of the CSR Committee	CSRB4
15	Ensuring 2 % spend	CSRB5
16	Disclosing reasons for not spending the amount (if applicable)	CSRB6
	Sum of Average of values of variables related to Responsibilities of Board of Directors	CSRBAVG
	Extent of Relevance of Content of CSR policy as per New companies act 2013	
17	An organization's plans for CSR projects or programs	CSRPO1
18	Execution methods of such projects or programs	CSRPO2
19	Schedules for implementation	CSRPO3
20	A clause specifying that the CSR surplus shall not form part of the business profit of the company	CSRPO4
21	Preference to local areas	CSRPO5
22	Monitoring process	CSRPO6
	Sum of Average of values of variables related to Extent of Relevance of Content of CSR policy as per New companies act 2013	CSRPOAVG
	Reasons for Doing CSR	
23	Regulatory Obligation (In compliance with Sec.135 of Companies Act 2013)	CSRR1
24	Business responsibility towards society	CSRR2
25	As a part of Corporate Policy	CSRR3
26	Replenish what has been taken from society for business	CSRR4
27	Making use of vital social sector contributions to leverage industrial profits	CSRR5
28	Indirect benefit to company (e g tax saving, publicity)	CSRR6
29	Bringing corporate goals into alignment with societal goals	CSRR7
30	Improving the profile and image of the company	CSRR8
	Sum of Average of values of variables related to Reasons for Doing CSR	CSRRAVG
	The extent of CSR disclosure practices as per the New Companies Act 2013	
31	CSR Policy disclosure on the company's website and in the report	CSRD1
32	Disclosure of Prescribed CSR budget	CSRD2
33	Disclosure of details of utilization of CSR funds	CSRD3
34	Disclosure of reasons for not spending the amount (if applicable)	CSRD4
35	Disclosure of reasons for not spending the amount (if applicable)	CSRD5
	Sum of Average of values of variables related to Extent of CSR disclosure practices as per New Companies Act 2013	CSRDAVG
	Focus areas of CSR as per Schedule VII of Companies	
36	Preventive health care, eradicating hunger, poverty, and malnutrition	CSRACT1
37	Promoting education, and vocational skills	CSRACT2
38	Promoting gender equality, empowering women, and reducing inequalities	CSRACT3
39	Ensuring environmental sustainability	CSRACT4
40	Protection of national heritage, art, and culture	CSRACT5
41	Measures for the benefit of armed forces veterans, war widows and their dependents	CSRACT6

42	Training to promote sports	CSRACT7
43	Contribution to the Prime Minister's national relief fund	CSRACT8
44	Contributions the central government fund	CSRACT9
45	Rural development projects	CSRACT10
46	Slum area development	CSRACT11
	Sum of Average of values of variables related to Focus areas of CSR	CSRACTAVG

Hypothesis Testing

A correlation between the identified variables was found for the first hypothesis in order to test its significance. In order to do so, the average value of each parameter considered for hypothesis 1 is separately calculated, and then correlation testing was done for this variable.

Table No. 6: Correlation Table – Hypothesis 1

Correlations		CSRAVG	CSRPAVG	CSRCAVG	CSRBAVG	CSRPOAVG	CSRRAVG	CSRDAVG	CSRACTAVG
CSRAVG	Pearson Correlation	1	.777**	.801**	.811**	.628**	.450**	.739**	.361**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	106	106	106	106	106	106	106	106
CSRPAVG	Pearson Correlation	.777**	1	.883**	.859**	.743**	.408**	.705**	.371**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	106	106	106	106	106	106	106	106
CSRCAVG	Pearson Correlation	.801**	.883**	1	.956**	.673**	.380**	.795**	.335**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	106	106	106	106	106	106	106	106
CSRBAVG	Pearson Correlation	.811**	.859**	.956**	1	.669**	.370**	.738**	.310**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.001
	N	106	106	106	106	106	106	106	106
CSRPOAVG	Pearson Correlation	.628**	.743**	.673**	.669**	1	.408**	.530**	.391**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	106	106	106	106	106	106	106	106
CSRRAVG	Pearson Correlation	.450**	.408**	.380**	.370**	.408**	1	.364**	.410**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	106	106	106	106	106	106	106	106
CSRDAVG	Pearson Correlation	.739**	.705**	.795**	.738**	.530**	.364**	1	.272**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.005
	N	106	106	106	106	106	106	106	106
CSRACTAVG	Pearson Correlation	.361**	.371**	.335**	.310**	.391**	.410**	.272**	1
	Sig. (2-tailed)	.000	.000	.000	.001	.000	.000	.005	
	N	106	106	106	106	106	106	106	106

**. Correlation is significant at the 0.01 level (2-tailed).

As observed in the above table value of Pearson Correlation is positive and found to be significant at 0.01 level as the p-value for the 2-tailed test in every case is less than 0.05. It indicates that all the variables are significantly correlated with each other. It may be stated that CSRAVG is - Sum of the Average of values of variables related to CSR Policy, CSRPAVG is - Sum of the Average of values of variables related to Organization and CSR Practices, CSRCAVG is - Sum of the Average of values of variables related to Functions of CSR Committee, CSRBAVG - Sum of Average of values of variables related to Responsibilities of Board of Directors, CSRPOAVG - Sum of Average of values of variables related to Extent of Relevance of Content of CSR policy as per New companies act 2013, CSRRAVG - Sum of Average of values of variables related to Reasons for Doing CSR, CSRDAVG - Sum of Average of values of variables related to Extent of CSR disclosure practices as per New Companies act 2013and

CSRACTAVG - Sum of Average of values of variables related to Focus areas of CSR as per Schedule VII of Companies are strongly correlated with each other.

In order to test linearity i.e. CSR policy in line with Companies Act 2013, linear modeling is carried out, the output is presented below. Here variables related to the existence of CSR policy and variables related to CSR practices are considered fixed variables and covariable.
The SPSS output was as follows –

Table No. 7: Multivariate Tests – Hypothesis 1

Multivariate Tests[a]		Value	F	Hypothesis df	Error df	Sig.
Effect						
Intercept	Pillai's Trace	.405	11.103[b]	6.000	98.000	.000
	Wilks' Lambda	.595	11.103[b]	6.000	98.000	.000
	Hotelling's Trace	.680	11.103[b]	6.000	98.000	.000
	Roy's Largest Root	.680	11.103[b]	6.000	98.000	.000
CSRPAVG	Pillai's Trace	.565	21.244[b]	6.000	98.000	.000
	Wilks' Lambda	.435	21.244[b]	6.000	98.000	.000
	Hotelling's Trace	1.301	21.244[b]	6.000	98.000	.000
	Roy's Largest Root	1.301	21.244[b]	6.000	98.000	.000
CSRAVG	Pillai's Trace	.330	8.033[b]	6.000	98.000	.000
	Wilks' Lambda	.670	8.033[b]	6.000	98.000	.000
	Hotelling's Trace	.492	8.033[b]	6.000	98.000	.000
	Roy's Largest Root	.492	8.033[b]	6.000	98.000	.000
a. Design: Intercept + CSRPAVG + CSRAVG						
b. Exact statistic						

The above table shows significance related to Pillai's Trace, Wilks Lamda, Hotelling's Trace, and Roy's Largest Root as the p-value (significant value) is less than 0.05.
Further, the output of automatic linear modelingshows agreement with the linear model.

Table No. 8: Model Summary – Hypothesis 1

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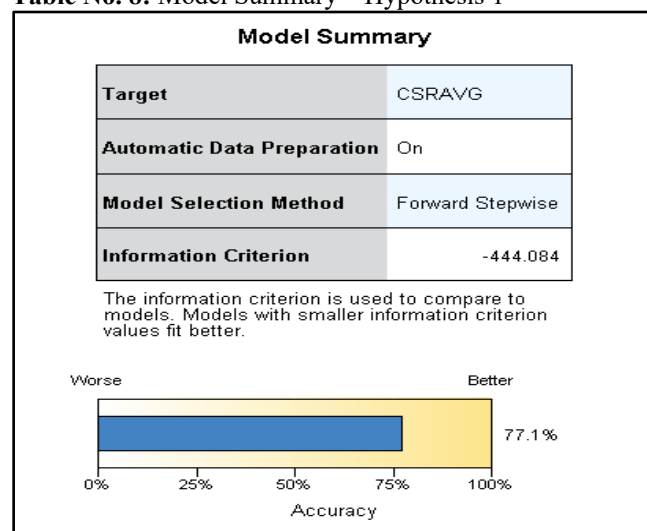
The abovetable clearly indicates that the model is a better fit as the value is 77.1%. It is an indication of acceptance of the first hypothesis, it can be stated that in the case of Large-Scale organizations the CSR policy is in line with the Sec.135 of the Companies Act 2013.

Hypothesis 2: Implementation of CSR practices is as per the CSR policy of the Organization.
Statistically, Hypothesis 2 can be stated as follows:
H_0: Implementation of CSR practices is not as per the CSR policy of the Organization.
H_1: Implementation of CSR practices is as per the CSR policy of the Organization.

Description of Variables
The variable description related to second hypothesis is as follows –

Table No. 9: Description of Variable – Hypothesis 2

Sr. No.	Description of Variable	Variable Name
	Organization and CSR Practices	
1	Presence of CSR Policy	CSR1
	CSR Implementation and Organization	
2	CSR as a part of Business Strategy	CSRIMP1
3	Selection of CSR activities are in accordance with Schedule VII of Companies Act 2013	CSRIMP2
4	Identification of Community needs through proper mechanisms before CSR implementation	CSRIMP3
5	Implementation and monitoring of CSR is in compliance with CSR policy	CSRIMP4
6	Precautions by the management about availability of CSR Funds	CSRIMP5
7	Transparency about utilization of CSR Fund.	CSRIMP6
8	Encouragement and providing enough support for implementation of CSR activities	CSRIMP7
9	Benefit of CSR to organization and community.	CSRIMP8
	Involvement of Stakeholders and CSR Implementation	
10	Board (Top Management) ensure that the CSR activities are conducted as per CSR policy of the company	CSRIMP9
11	The employees of the organization engaged/ involved in the implementation of CSR activities	CSRIMP10
12	Community members are actively involved in CSR activities carried out by Organization	CSRIMP11
14	CSR activities are implemented through Registered Trusts or society	CSRIMP12
15	CSR activities are implemented through NGO	CSRIMP13
16	The CSR activities are carried out ina collaboration with other companies	CSRIMP14
17	There is a collaboration of Government PPP (Public Private Partnership) for the execution of CSR activities	CSRIMP15
18	The CSR department directly carries out CSR activities	CSRIMP16
19	There is a CSR foundation for the implementation of CSR	CSRIMP17
	Sum of Average of values of variables related to CSR Implementation	CSRIMPAVG

In the case of the second hypothesis again the sum of the average value of variables related to the implementation of CSR (the variable description given previously) was found and then correlation followed by paired sample testing was done to test the hypothesis. The result of the analysis is given below.

Table No. 10: Correlation Table – Hypothesis 2

Correlations			CSR1	CSRIMPAVG
CSR1	Pearson Correlation		1	.530**
	Sig. (2-tailed)			.000
	N		106	106
CSRIMPAVG	Pearson Correlation		.530**	1
	Sig. (2-tailed)		.000	
	N		106	106
**. Correlation is significant at the 0.01 level (2-tailed).				

It can be stated that the variable CSR1i.e. the Presence of CSR Policy is positively and significantly correlated with CSRIMPAVG i.e. Sum of the Average of values of variables related to CSR Implementation.
Then Paired Sample Test is carried out to test the hypothesis. The outcome is presented below.

Table No. 11: Paired Samples Test – Hypothesis 2

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	CSR1 -CSRIMPAVG	-1.99168	.47619	.04625	-2.08338	-1.89997	-43.062	105	.000

As the p-value < 0.05, it can be stated that the implementation of CSR is happening as per the CSR policy framed by the Large-Scale organization which is in accordance with Company Act 2013. It is an indication of acceptance of the second hypothesis.

FINDINGS
The testing of the first hypothesis confirmed that the CSR policies of large-scale organizations are in accordance with the Companies Act 2013. The second hypothesis acceptance affirmed the first hypothesis, stating that CSR is implemented according to the CSR policy formulated by each Large-Scale organization, in accordance with the Companies Act 2013.

CONTRIBUTION TO THE RESEARCH AREA
The researcher studied the extent of compliance of CSR practices with Sec.135 of the Companies Act 2013 based on multiple parameters such as calculation of CSR budget, formation of CSR policy and Committee, CSR implementation procedure, and modalities used for CSR execution.

SCOPE FOR FURTHER RESEARCH
   a.   The comparative study of different CSR implementing modalities used for CSR execution will help the companies to select the most appropriate implementing partner for CSR execution as per the need and suitability.
   b.   Research on the evaluation of the impact of CSR on different stakeholders will further enhance the CSR performance of the company.
   c.   The effects of implementing CSR practices in compliance with CSR policy formed on organizational performance can be studied using qualitative research.

CONCLUSION
Most Organisations have formed CSR committees to form and implement CSR policies. The Board of Directors and CSR committee members are found performing their responsibilities toa great extent as specified in Sec. 135 of the Companies Act. 2013. In concluding remark, it can be stated that most of the large-scale organizations in

Pune that fall under the purview of CSR have conducted CSR as per provisions in Section 135 of the Companies Act 2013.

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A STUDY ON ARTIFICIAL INTELLIGENCE IN IT AND ITES SECTOR IN BANGALORE

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ABSTRACT
Indian IT carrier merchandisers with a protracted history have started to hone their capabilities in ultramodern technology like synthetic intelligence (AI), generally in response to client solicitations for guests who're virtual assignment metamorphosis. As they end up less apprehensive of manipulating the vast volume of data generated from their processes, guests, throughout diligence, are seeking out AI- primarily grounded complete results. Gain an aggressive aspect through the optimization of enterprise processes. They're being dragooned with the aid of using the solicitations of the virtual metamorphosis to quest for believable merchandisers of AI results, particularly within the Indian IT sector. Some notorious Indian IT groups have set up their veritably own laboratories to fulfill those conditions. The operations of an AI exploration unit inside an Indian service-grounded IT company are examined in this paper, along with the difficulties the unit encountered due to the recent epidemic, which forced unit members to switch from company-located office work to remote cooperation. In this environment, we explore our ethnographic findings to punctuate the socio-specialized features of similar developing AI exploration groups and to explain how the epidemic-convinced WFH has changed how actors coordinate.
Keywords: Indian IT, Operations, ethnographic, WFH

INTRODUCTION
IT (Indian Information Technology) and enterprise system control BPM) carrier merchandisers have learned the artwork of world IT outsourcing because of labor figure arbitrage, conditions stuck to keep system quality, and their capability to manipulate enterprise in away oils surroundings (Abbasi, Sarker, & Chiang, 2016). A tremendous pool of similar carrier merchandisers or carriers with stylish system-wide rankings are well-known for finishing figure-optimized but exquisite IT-BPM enterprises for worldwide Guests throughout business verticals (Adamovic ,2018).. These providers were cabin a position to set up and maintain long-lasting connections with their guests; thank you to their important control of scattered software program enhancement and BPM enterprise (Agrawal, Khatri, & Srinivasan, 2012). Indian IT carrier merchandisers with a protracted history have these days started to hone their capabilities in ultramodern technology like synthetic intelligence (AI), generally in response to client solicitations for guests who're virtual assignment metamorphosis (Alter,1999). As they end over lesser apprehensive of manipulating the vast volume of data generated from their processes, guests, throughout diligence, are seeking out AI- primarily grounded results. Gain an aggressive aspect through the optimization of enterprise processes (Alter, 2001). They're being dragooned with the aid of using the solicitations of the virtual metamorphosis to quest for believable merchandisers of AI results, in particular within the Indian IT sector. Some notorious Indian IT groups have set up their veritably own laboratories to fulfil those conditions. Indian, for case (Alter, 2013).

In order to contain the epidemic, a lockdown was enforced in March 2020, which needed an obligatory WFH for all labor force in this sector, including those working in these exploration units. Newspapers suggested brewing layoffs if WFH persisted, particularly in relation to the exploration groups probing AI data (Amershi et al., 2019). It was anticipated that workers in these units would be the first bones let go during this time (Barley, 1996). They stated that guests might choose descriptive analytics alone, devoid of any Artificial intelligence capabilities or conventional analytics, stating that previous data may now no longer be applicable for soothsaying in the gruelling times to come (Barley, & Kunda, 2001)]. We had a fortunate occasion to probe the challenges of work from home faced by workers because we were doing a plant ethnography study in Bengaluru, India, in an established service- grounded IT association's AI exploration lab from January to May 2020. The ethnographer — worked full- time on an on-going Artificial intelligence grounded design that this unit's members were managing as part of this ethnography. By trying to give answers to the following precise exploration questions, we seek to address the preliminarily mentioned exploration content. 1. How do service-grounded IT businesses' recently developing AI exploration divisions fit into the sociotechnical geography? 2.

How was the collaboration in similar units disintegrated by the epidemic, which redounded in a remote platoon-working? Then we're using WST (Work System proposition), (Baruah, (2020), as a theoretical frame for probing these issues. WST is a guru- acquainted proposition that offers directors a standpoint for understanding organisational systems and enforcing both the specialized and non-technical social and business factors (Baruah, (2020). It also helps us to talk about how a system like this provides goods or services that feed to client requirements. This was done in order to organise the preliminarily unshaped conduct carried out while working on earlier AI systems for this unit and show them to the platoon. The whole purpose of this process was to guide the aged members of this unit in enforcing helpful perceptivity into their on-going work to produce AI-compatible workflows for forthcoming customer systems. The main subject of compliances and reflections regarding this exercise concentrated on the essential rudiments that (Baruah, (2020) emphasised while developing this work system. Background and Theoretical Framework For enterprises across all assiduity sectors, results girding slice- edge technology like AI and pall are getting more and more pivotal. On" mortal decision making" in enterprises, AI incorporated within conventional information operation systems is anticipated to have a significant impact (Bhalerao (2020). Organizations are decreasingly using AI or Big Data analytics results to prize practicable perceptivity from data due to surge in number of of data as well as the drop in calculation costs (Bhalerao (2020). All services will be demanded to keep a track of the data storehouse and service conditions for such a large volume and variety of data analysis (Buytendijk, 2014). The IT sector guests are looking for growth through digital metamorphosis and are apprehensive of the critical need to modernize their old systems, lower the cost of software conservation and make the software adaptable to the requirements. MSME's also turning to innovative service immolations like AI to enhance their core business processes (Camm, Davenport, 2020). Clients are fleetly moving towards process metamorphosis through robotization, and as a result, they want IT service providers of India to offer guaranteed business process management results. These technologies know how are being incepted into Indian IT organisations piecemeal from the usual software job liabilities. Collaborations with elite request players in arising technologies is the stylish game plan for large Indian IT organisations to gain lead. The main plan espoused by a significant number of those organisations is still in- house capability development through necessary reorganisation and resource balancing measures (Camm, Davenport, 2020). Large Indian IT companies like Wipro, Infosys, TCS, HCL, and others have developed AI exploration labs during the once five times. This development indicates a rapid-fire penetration of similar developing exploration units inside the Indian IT assiduity. Hence there's a swell of new places like pall engineers, data scientist, pall masterminds, and data masterminds who unite with well- known design operation house for places like business judges and design directors, software mastermind, software mastermind (Camm, Davenport,2020). Typical Workflows in AI and Software Development are covered by a single IT organisation. We concentrate on one similar exploration group that was established within a estimable IT services company to work on AI- related issues. We believe it's pivotal to first describe the ideal-typical AI or machine literacy (ML) design workflow, the main work factors, and their non intercourses in order to comprehend the work performed by members of this unit. Also, we compare it to the processes used in conventional software development. thus, new places similar as (Carmel, & Agarwal, 2008) claim that a crucial element of AI results is the" data" that drives Machine literacy (ML) models. The two primary labour factors that make up the core AI/ ML workflow, banning the product deployment, are generally data pre-processing and model creation. (Carmel, & Agarwal, 2008) First, structured and unshaped data must be pre-processed by being gutted, labelled, and applicable features or variables are uprooted. Before carrying both the pre-processing and model factors for product deployment, this element provides an alternate work element, ML model training and evaluation (Cataldo, Bass, Herbsleb, & Bass, 2007).

SYSTEM OF WORK

According to Wikipedia," a work system is a system in which mortal actors or machines conduct work using information, technology, and other coffers to produce specific products services for specific internal or external guests." A current standpoint in IS literature has been to see systems purely as specialized artefacts or as stoner-configurable combinations of tackle and software (Baruah, (2020). By offering fabrics and ways for business professionals to study organisational systems, anyhow of whether they're connected to IT (Baruah, 2020). Organizational socio-specialized systems can be understood from both static and dynamic perspectives using the fabrics handed by work system proposition (work system frame and work system life cycle model). Nine factors, grouped into three main groups, make up the generally steady" form, function, and terrain" of a work system, according to the work system frame. The first order includes rudiments that are wholly contained within the work system, including people, processes or conditioning, information, and technologies. The alternate order consists of guests and goods services. They must be integrated into the work system indeed though they aren't considered workers. The third type is made up of rudiments like organisational terrain (the artistic, competitive, nonsupervisory, and demographic environment in which an organization operates the work system), structure (applicable human, specialized, and instructional coffers handed by the organization to the work system), and strategies (alignment of enterprise strategy with work system strategy). (Zahedi, Shahin, & Babar, 2016).

Although they're external to the work system, these organizational factors directly impact its internal rudiments. The third class includes rudiments like organisational This frame, which functions as a chart, enables one to pinpoint any working system by the individualities who, while carrying out their duties, unite with one another via information and technology as part of either structured processes or unshaped conditioning. It also enables taking into account how this work system interacts with consumers or guests while furnishing goods or services that meet their requirements. Last but not least, it aids in defining the operations of the work system inside the general organizational structure made up of its surroundings, structure, and strategies. (Chawla. 2020)

METHODOLOGY
Empirical Setting
The service-grounded IT Company in Bengaluru, India, where one of us locked in its lately established exploration unit for working on AI systems, serves as the empirical setting for our study. This company has over 25 years of experience and is famous as a seller providing IT-BPM services to guests worldwide. lately, it assembled individualities from traditional software brigades, hired labor force for new job orders, and established an internal exploration division to keep up with the guests' evolving technology requirements. (Chen, Chiang, & Storey, 2012). The main motifs covered in this subject are pall and AI-related results. This company has developed towards creating bespoke pall-grounded software results. Over the five times, it has become fairly successful in acquiring patented AI results as intellectual property. (Zaharia, et al., 2018). The main motifs covered in this subject are pall and AI-related results. This company has developed towards creating bespoke pall-grounded software results as guests resettle from on-premise waiters to pall settings, expecting lower software and data operating costs. Still, this platoon has made creating bespoke AI results for guests looking to automate business processes top precedence. As a result, over the once five times, it has become fairly successful in acquiring patented AI results as intellectual property. (De Souza, et al., 2004).

ANTHROPOLOGY AT WORK
Our main thing in doing this study was to understand colorful job functions and how they interact with one another in the environment of masterminds' social mobility within the Indian IT sector. This issue was particularly intriguing because this business is transitioning to producing results around slice-edge technology like AI and pall. We chose to conduct primary exploration because there needs to be more secondary information on these motifs. We chose party-observation-grounded ethnography because we allowed it to allow us to learn about the complexity of labor and work relations as they passed in situ within one company over a sizable period. The jottings of Barley and Kunda served as alleviation for our choice of ethnography (De Vreede et al., 2016) and assert that organizational proposition exploration has faded into obscurity and that numerous studies either admit the complexity of work or brush away the" question of how work might be evolving." still, he asserts that ignoring the difficulties of the job may make it delicate to comprehend any social marvels that take place in businesses. The nature of work in the moment's world is nearly related to organizational structures. These ultimate must acclimate to the changing nature of work to reduce the threat of "getting deranged with the conditioning they organize," according to (De Vreede et al., 2016). Thus, introducing work into organizational studies is essential, particularly in the current terrain where requests are continually expanding, and technologies are constantly changing, impacting organizations internally and outdoors. They support the use of plant ethnographies as a feasible methodology. Ethnographies encourage experimenters to connect their findings with a broader understanding of organizations positioned in analogous surroundings and made up while also giving a native perspective on in situ work practices and procedures. (De Vreede et al., 2016). According to Barley and Kunda, the nature of work in the ultramodern world is explosively tied to organizational structures, which must acclimatize to the changing nature of work to lessen the threat of" getting deranged with the conditioning they organize" (Dennis, Wixom, B. H & Roth, 2018). As a result, it's argued that it's pivotal to introduce work into organizational studies, especially in the current climate where requests are fleetly expanding, and technology is fleetly changing, impacting organizations both internally and outdoors. In this regard, they use plant ethnographies as a strong methodology. (Dossani, & Kenney 2007). In addition to furnishing a native perspective on in situ work practices and procedures, ethnographies help experimenters to connect their results with a further comprehensive understanding of organizations located in and made up of analogous surroundings. The last idea was to help the ethnographer triangulate and validate his or her findings. The first two tasks were seen as value- adds that the ethnographer would give to the platoon. The first two tasks gave the ethnographer a good knowledge of how this AI exploration unit functions. (Duan, Edwards, & Dwivedi, 2019). The ethnographer's compliances and reflections while carrying out these chores in the office and at home following the lockdown served as the foundation for this study. Given its emphasis on actors and their collaboration through information and technologies while executing labor to produce goods or services for the guests, it also encouraged us to consider the work system proposition as a theoretical frame. Working alongside platoon members on a design, going out to eat with them for breakfast, lunch, and coffee, striking up improvisational exchanges near workstations, attending platoon meetings, knowledge transfer sessions, birthday fests, hand

farewells, and numerous other events handed the foundation for the ethnographer to develop a close relationship with the platoon members. They allowed him or her to become a member of the platoon (Economic Times. 2020).

STATISTICAL ANALYSIS

Our party-observation-grounded ethnography allowed us to learn about the nuances of work and work relations as they took place over the course of four months within this organization. Working as a full-time intern on an active AI design with other platoon members allowed the ethnographer to internalize the complications and complications of work practices, work procedures, and how different job positions interacted throughout the design and beyond. also, the assignment to conduct unshaped interviews with some of the platoon members to comprehend the design workflows allowed the experimenters to understand the entire work processes within which AI design conditioning was carried out.(Esbensen, & Bjørn, 2014) By working from the office for roughly three months and from home for further than a month during the design's prosecution, the ethnographer was suitable to record distinctions like work-part relations between in-office and at home. (Yilmaz, O'Connor, & Clarke, 2015) The distant compliances between work connections in the office and from home in the environment of this design served as the main motivation for conducting this particular study and served as the alleviation for this ethnography's emic perspective. (Espinosa, Slaughter, Kraut, & Herbsleb 2007) By speaking with the unit's members or actors, the ethnographer was suitable to understand the defence for AI systems, the nature of colorful workplaces, the relationship between these actors, their previous educational and professional backgrounds, and their unborn bournes. The ethnographer's scrupulous notes on the day's work, relations with workers, compliances of the plant, unshaped interviews (UI), and robotic exchanges(IC) with platoon members served as the base for the qualitative data for our study. (Fersht, & Snowdon, 2016) For case, the platoon lead gave the ethnographer the task of speaking with the platoon members to validate the AI design's processes, which needed the ethnographer to solicit a number of the platoon members. The Indeed though the platoon lead had officially approved taking unshaped interviews regarding former AI design practises, there was a strict ban on scheduling meetings for similar interviews in order to record and transcribe them.(Grinter, Herbsleb, & Perry, 1999) Considering their excited schedules and organisational authorizations that prohibit the use of recording As a result, it was necessary for the ethnographer to conduct these interviews with the actors throughout the course of multitudinous quick exchanges. On specific cases, the ethnographer also made it a point to join the platoon members for their breakfast, coffee, or lunch. (Herbsleb, 2007) The ethnographer wrote down the crucial points from these interviews as memory labels on the phone where it was possible to do so, else as similar points or flashed back quotations(in italics), or both. The everyday informal addresses with platoon members that took place at design status meetings, in cells, over lunch, breakfast, or coffee were the only bones that the ethnographer recorded. (Herbsleb, & Mockus, 2003) When the ethnographer had the chance to physically part himself or herself from the platoon members. At the end of each workday, the ethnographer completely summarised and interpreted the unshaped interviews and exchanges grounded on these brief memory labels and any other significant points. These were participated with the study mate and tutor each day. Any understanding gaps regarding a specific observation or party's point of view were filled in during posterior relations with the platoon members. The ethnographer was obliged to give the platoon leader and other actors a summary of their study findings every week. A formal donation was also listed for the end to give the group a summary of their field notes. During these donations, we had the chance to ask the platoon members any questions that could help us understand and grasp the material more. (Holmstrom, 2006)

AI project types

This company is well- known for furnishing Software (SW) and Business Process Outsourcing (BPO) services to guests across assiduity verticals like banking and finance, logistics, healthcare, and numerous others, just like the maturity of service- grounded IT companies in India. (Hummer et al, 2019)This company performs BPO- related services, which entails maintaining guests' business processes through mortal and software- grounded interventions, in large part through the use of coastal development centres (ODCs). Guests now anticipate AI-stoked results from this company primarily to cut costs due to the growing demand to digitise and excerpt business perceptivity from unshaped process data, similar as process logs or textbook documents. (Jalote, & Natarajan, 2019) Herein lies the function of the AI exploration division. Guests anticipate an increase in per-worker productivity from the current BPO brigades in order to reduce awaited service costs, according to the business critic of the AI exploration unit. Guests set up this to be pivotal because they're presently passing a sharp rise in the demand for the digitization of their process documents and honor the eventuality of artificial intelligence (AI), particularly natural language processing (NLP), to condense and speed up the homemade data entry work. (Jordan & Mitchell, 2015) The BPO pool is typically in charge of manually rooting fields from the unshaped process data, which is generally textbook documents, or using straightforward rules. Thus, it's important to support BPO work with some quantum of robotization using AI. Through its exploration enterprise including the development of AI results for general use- cases grounded on off- the- shelf data sets, the AI

exploration unit within this company creates intellectual property (IP). still, a significant portion of the systems for this unit come from the use- cases for AI addition that guests request in addition to the standard IT- BPM systems that this organisation provides. (Kajarekar, 2020) The members of this section are constantly needed to address slice- edge AI use cases for these enterprises, which again aid in the development of IP. For this platoon to remain applicable inside the establishment, IP development enterprise that concentrate on the requirements of the customer are essential. Typical AI design phases We were suitable to comprehend the crucial conduct made by the members of this unit while performing a typical AI design thanks to the ethnographer's part of establishing design procedures. (Khan, Niazi, & Ahmad, 2009) There are three pivotal phases 1) design inauguration, which calls for the unit to vend guests on its AI capabilities; and Depending on the novelty of the use- cases, the use- case identification stage may or may not be followed by an intermediate evidence of conception (POC) stage. The use- case identification stage is followed by the product ionizing stage, which entails the prosecution and deployment of the performing AI result. Stage 1, Project Launch the deals platoon in this organisation is in charge of the original stage, known as" design inauguration." During the medication of these primary plan donations, the business critic constantly sits with data scientists and converses with them. These donations frequently include 1) Use- cases from former systems or general exploration IPs that the client could find intriguing, 2) High- position architectural or functionality mappings to meet the customer's possible AI use cases, and 3) a summary of the donation. 3) Proposed integration with the customer's major IT- BPM design; 4) Proposed total cost of power estimates if similar systems are accepted. Based on the feedback from the guests, their internal BPO brigades, and the data scientists, the business critic consolidates his understanding of the customer's business processes and prospective AI use- cases as further meetings with the guests take place. (Liu, 2014) Stage II relating use cases the ensuing stage constantly occurs at the customer's position after the design inception phase is over. This phase is known as "use- case identification". This phase tries to restate customer demands for enhancing business processes into use cases for AI. The customer's business platoon including the business critic, design director, and data scientist are involved at this stage. Data scientists are suitable to judge how well different ML- grounded results fit the requirements of guests because to their knowledge in this area. In a factory setting, the business critic and design director work together to intervene communication between the customer's business platoon and the data scientist and to make sure that the use cases are counterplotted for client requirements. (Marjanovic & Murthy, 2016) In the ultimate script, data scientists are retained after this point to present the client with a prototype AI result, or" evidence of conception"(POC), for their new concepts. However, an elderly data scientist and youngish data scientists experiment together to develop prototype results using that data as well as any other commercially accessible data that's analogous in structure, If primary customer data is available at this point. Off- the- shelf data is constantly handed in the form of open- source standard datasets or any non-confidential data used from the platoon's previous client work. (Mathur, 2020) Pre-processing and model creation, the two crucial factors of this prototype AI, are platforms that may be worked on in Python and R programming surroundings. (Whitehead, 2007)Third Stage Product ionizing The AI design is carried out by data masterminds throughout the product ionizing stage, and the performing result is stationed onto pall or on- premise customer waiters by software/ pall inventors. Data scientists are only used as informal counsels at this point. Due to confidentiality enterprises, guests frequently give a small sample of primary data with the AI platoon, with the anticipation that it would be used to develop the pre-processing and ML model factors. (Xin, Ma, Song, & Parameswaran, 2018) They do not completely expose their data to these factors until software/ pall masterminds have developed the necessary stoner interfaces and wrappers that can cover customer data's obscurity. The pre-processing element of the AI design is substantially handled by data masterminds, who use the Python and R programming surroundings to produce new pre-processing operations or programs. (NASSCOM, 2017)

Observations Made Using the Work System Framework
The essential socio-specialized rudiments connected to the work system. Actors like the platoon lead, business judges, design directors, data scientists, data masterminds, and software/ pall masterminds are at the centre of this work system. These actors banded through the sharing of specific types of information, similar as a) the business critic's high- position functionality charts or armature plates of AI use cases related to customer systems, b) the data masterminds' donations during meetings, c) customer data analysis, d) implicit information about compatible pre-processing and ML model. (NASSCOM, 2018a) This work system is an arising one and is characterized by conditioning or processes that are still under development. This work system's operation was easily told by the customer- centric organisational principles and pretensions, as shown in a) the type of the AI systems that were performed and b) the impact of customer-friendly software workflows on those conditioning. Still, by furnishing this exploration unit with fresh structure for bearing exploration conditioning that are generally unapproachable to other organisational units, the parent organisation made a trouble to assure some degree of inflexibility in its operations (NASSCOM, 2018b).

DISCUSSION

The answers to the questions we posed over are tried by interpreting the fore named data astronomically within the work system frame. Our results indicate that the customer- service provider connection dominates similar arising work systems, which is applicable to the first content, which concerns the socio-specialized setting in which AI exploration units of service- grounded IT businesses serve. (NASSCOM, 2019) Our exploration demonstrates how the conditioning carried out by the AI exploration unit while carrying out AI systems were greatly told by the organisational styles essential to maintaining customer- seller connections. The type of AI systems this unit shouldered was substantially determined by customer demands unique to the outsourcing setting. (Ng, 2018) The maturity of these enterprises concentrated on adding AI to common IT- BPM outsourcing systems, where guests recognised AI's eventuality in attaining cost reduction and process optimization. Traditional design operation liabilities, software development places, and AI-specific positions like data masterminds and data scientists were each filled by actors in the AI exploration unit. (Niazi et al, 2016) Although these actors communicated informally within the office due to the generally underdeveloped and inharmonious process processes, they coordinated through programming platforms and surroundings, instant messaging, and virtual meeting technologies. Similar unofficial routes were pivotal in the setting of this study, especially for data masterminds who were new to the field of artificial intelligence. In attaining cost reduction and process optimization. (Niazi et al, 2016b) Actors in the AI exploration unit enthralled traditional design places. The data masterminds' capability to plan and carry out work singly depended on the informal and unshaped workflow channels that were available. Thus, for these new work systems, it's vital to rethink the effectiveness of current workflows or processes and how colorful actors' benefactions fit into them in attaining cost reduction and process optimization. (Nidhra, Yanamadala, Afzal, & Torkar, 2013) The AI exploration unit's actors worked on a conventional design called Co- The results of our study suggest that being processes or workflows should be precisely considered, particularly in the environment of systems using arising technologies, where the work inflow differs noticeably from that of conventional IT- BPM enterprise. We hypothesise that working the environment- mindfulness issue for colorful actors by creating suitable workflows is pivotal for these recently arising work systems in an outsourcing setting in attaining cost reduction and process optimization. (Olson, & Olson, 2000)Theoretical Counter accusations were a typical design that actors in the AI exploration unit worked on. Our study adds to the body of work formerly written in the IS literature on remote brigades. The literature that's presently available on this content concentrates on the collaboration difficulties seen in distributed software development surrounds and technology results to similar surrounds' dispersed brigades' collaboration issues (Orlikowski, 2002). A large portion of this literature discusses remote brigades in an outsourcing setting while fastening on the difficulties and implicit fixes for icing effective collaboration between customer brigades and seller brigades (Parnas, 1972) in attaining cost reduction and process optimization. The AI exploration unit's actors worked on conventional systems. Co- By pressing the collaboration dislocation difficulties in a fairly new work system that's just now forming in the environment of offshore, our study adds to this body of knowledge. While working on systems centred around slice- edge technology like AI, these developing work systems are still kindly dependent on the conventional service- grounded IT businesses' organisational environment. Given the lack of any standardised processes or styles for unevenly allocating duties among actors who are spread out geographically in these types of work systems where the work and work liabilities are fairly new, co-location is seen as a natural choice (Patnayakuni, & Ruppel, 2010). In attaining cost reduction and process optimization. Our study highlights the crucial socio-specialized rudiments and operations of these arising work systems and highlights the peculiarity of collaboration dislocation that occurs when the co-located actors of these arising work systems are suddenly needed to work ever. Actors in the AI exploration unit enthralled traditional design Co- given the unique environment of these work systems. Our findings punctuate the extent to which organisations are impacting these new work systems, particularly in terms of how living organisational routines affect how these new work systems serve. In the arising technology sector, where task division is gruelling, it also emphasises the need to define compatible workflows and borrow necessary platforms to address the environment- mindfulness issues of colorful actors. This is especially true for freshman places. (Petersen & Wohlin, 2009) This study emphasises the value of using ethnography as a tool to punctuate the diversity of circumstances where distributed brigades' collaboration is visible. When compared to other positivist methodologies like controlled trials, it's extensively conceded in the IS field that qualitative methodologies like ethnography and case studies offer important tools for pressing the surrounds pertaining to collaboration within distributed brigades (Rajkumar & Mani, 2001). Although we were unfit to bandy the dynamic view of the work system in this study, long- duration ethnography studies can disinter precious perceptivity about how work systems evolve or stabilise. This study also highlights the significance of ethnography as a methodology to punctuate the uproariousness of surrounds in which the work is done.(Ramasubbu et.al, 2005) Our findings indicated colorful adaptations and workarounds that the actors used when responding to guests' prospects, the overall organisational terrain, and strategies despite the fact that this was a veritably short- term ethnography. In this regard, we suppose that the study's findings could give academics and business professionals sapience into the eventuality of these new arising technology work systems that are

snappily spreading in an offshoring environment. Practical counteraccusations The study's practical counteraccusations concern two areas a) the factors at the individual or hand position that HRM interpreters constantly draw on; and b) the operation of arising technology systems in the environment of coastal outsourcing, a fairly new and developing terrain in the Indian IT sector. This exploration highlights the value of ethnography as a methodology for pressing the variety of situations in which the conclusion is made. (Wang, Gunasekaran et al, 2016)

CONCLUSION

The operations of an AI exploration unit inside an Indian service- grounded IT company are examined in this paper, along with the difficulties the unit encountered as a result of the recent epidemic, which forced unit members to switch from company located office work to remote cooperation. (Roy. 2020) In this environment, we explore our ethnographic findings to punctuate the socio-specialized features of similar developing AI exploration groups and to explain how the epidemic- convinced WFH has changed how actors coordinate. (Runeson & Höst, 2009) By analysing our ethnographic compliances via the prism of the work system frame, a pivotal element of the study, we punctuate its major conclusions. (Sculley et al., 2015) Our findings generally point to the necessity of optimising processes in these new work systems, interacting with arising technologies like artificial intelligence (AI), which are snappily spreading throughout the IT sector, especially in outsourcing surrounds like India. (Strode, D. E., 2016) In addition to agitating their significance in the environment of starter jobs working in the AI field, we emphasise the significance of similar processes in diving the collaboration dislocation challenges in distributed platoon surrounds. The challenges faced by distributed brigades in a fairly new setting — AI exploration units that are just arising in coastal outsourcing surrounds like the Indian IT sector — are bandied in our study as a complement to the being literature on distributed brigades in the IS literature. The practical ramifications of our study concern the operation of systems involving arising technologies (like AI) and hand- concentrated mortal resource practises that address the enterprises of particular workers in similar situations. (Tavaga, 2020)

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A STUDY ON FACTORS INFLUENCING THE PERCEPTION OF QUICK SERVICE RESTAURANT (QSR)CUSTOMER TOWARDS ONLINE FOOD ORDERING IN PUNE REGION

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ABSTRACT
Online food delivery is becoming very popular day by day and is become a fashion now to order food online from home or workplace. Quick service restaurants (QSR) are growing very rapidly all over India due to its quick food preparation, consistent quality taste and minimum service time. In last decade tremendous growth in ordering food online seen in this sector. With the change in customer food preferences and food habits, ordering food online from quick service restaurants become most preferred destination for food lovers. Nowadays people start ordering parcel food from restaurant as well as quick service restaurants. Online food ordering is becoming very popular all over the India due to ease in use, convenient mode of payment, choice of food offered by QSR outlets, number of outlets available on apps which offers discount and coupons on online food ordering and food order delivery service to your doorstep. In today's competitive world, the restaurants and various fast-food outlets must often upgrade their menu in order to satisfy the need of customers and their demand, online food ordering is much popular among the younger generation due to attractive offers and discounts offered by online food ordering apps.

The present paper focuses on factors influencing on customer perception while ordering online food. People from Pune region selected for this study, and it is found that the customers of all generation like quick service restaurant food. They are very much happy with the online food ordering app. The future of online food ordering companies seen brighter.

Keywords – Quick service restaurant, Fast food, Online food delivery apps

Introduction
Online food ordering is becoming very popular all over the India due to the hassle-free process and it saves lot of people's time in daily busy schedule to go in restaurant and place the order. Online food ordering is liked by everyone due to ease in use and mode of payment, choice of food and number of outlets available on apps, offers or discount receive on online food ordering and home delivery service. Online food ordering apps and sites are made such a way to meet customer expectation. The main key factors responsible for increase in online food ordering is, hectic work schedule, increase in working of young generation, change in taste buds of food lovers, change in lifestyle of customer, increase in the disposal income, husband and wife working both so not have much time to prepare food at home, increase in number of quick service restaurants providing variety of national and international food and the Offer and discount offered by online food ordering apps. The study is conducted in Pune city of Maharashtra, India. Pune is the fastest growing metro city in India. The area of interest in this research paper which is Quick service restaurants (QSR) also known as fast food outlets customer perception in ordering food online

Development and innovation in electronic media seen in past few years due to advancement in the technology which has transformed entire scenario of food service industry. Nowadays everyone is using smart phone, and everything is available on smart phone on just a single click. Food is also not an exception for this. Online food ordering apps are most used in all hotels, fast food outlets and restaurants. They are the media between customer and food outlets who deliver parcel of food orders to customer doorstep. Menu dishes with picture and price on online food ordering apps enable customer to place their choice of order with just click of button. Online food ordering meets the requirement of people to place the order online and receive order within few minutes. On top few online food ordering apps are providing offers to the customers to attract more customers towards ordering food online. This gives lot of options to the customers to choose from. In online food ordering restaurant pay certain percentage with state and central tax to online food companies.

At present, there are many established online food ordering apps available in the market like Swiggy, Zomato, Food panda, Uber eats, Fresh menu etc, who provides food serviced to customer doorstep.

Also, there are few well known national and international brands are there in market who is having their own online food ordering app like Dominos, Fassos, Pizza hut, Box 8, KFC etc. These companies creating lot of jobs opportunities for many needy personals. There are few brands of QSR outlets who are also tied up with some online food delivering app like Eat sure, Eat club apart from popular online food ordering apps. Some QSR

outlets and restaurants also have own outlet app for customers to order food online and provide free home delivery services.

Apart from providing food delivery services, online food ordering apps offer discounts or discount coupons or vouchers to increase sale and benefit outlet by increase in outlet views. Discount and cash back offer play very important role in ordering food online. It became very popular especially in young generation to take the advantage of such type of offers by ordering food online and avail the discount by redeeming coupon or applying redeem coupon code while ordering food online. Currant youth generation is seen very keen in availing such types of offers. They are very much interested to order food online by using offers and discount than delivery from a specific outlet. Due to the popularity of online food ordering growing very rapidly, the expectation of customers also increased which put lot of pressure on food outlet to prepare food quickly and handover immediately to delivered person rather than giving good quality of food and service.

To avail the facility of ordering food online, customer has to-do registration on the app, for this they must download the app on the smart phone, create profile which has all the necessary information and fill payment information. Your account can be immediately created. Many modes of payments are available on the app like debit, credit, wallet pay, app pay, cash on delivery etc. Different online ordering apps provide different services and each app differs one another in respect of app features, promotion campaign, customers review, price, offers or discount and food outlet also. There is competition between the online food ordering app and free home delivery which is given by particular restaurants.

For the food outlets to become a partner in online food ordering, restaurants have to register themselves, provide fssai license number, shop act license and fill all necessary information pertaining to food outlet on web based ordering site and apps like Zomato, swingy, food panda etc.

The Apps having the number of quick service restaurant with menu which does not require any leaflet or menu list for ordering food. It became easy for customers to order food online on click. Apps can easily be downloaded from play store from android smart phone which make them easy to use and order food. On app, you need to register yourself by filling correct information of your address and profile, required mode of payment information, you can create an account. There are growing number of players in market. Zomato, Swiggy, food panda, Ubereat, Just eat are some main players in this segment. Different online ordering apps offering different services like offers, coupons discounts, menu with offers, fast food outlet previous history, feedback, suggestion, customer review etc. Few big quick service restaurants brand have their own service of delivery like KFC, Dominos, Pizza hut, Fassosetc. The online ordering system has created a new place in employed people's kitchen. This online ordering sector will grow huge in future providing convenience to customers, satisfaction and create interest for ordering food online. Due to the introduction of innovative technology and interested class of food loving customers are having so many choices in menu varieties to select it.

Review of Literature

A study done by Dr Manish Kumar Srivastava, Mr. Atul kumar Srivastava (March 2021) in "Online food delivery: study with special reference to food aggregators". Reveals that Zomato and Swiggy are main food aggregators in market, The technology in online food ordering affected each stakeholder in society and how online companies convert technology in customer favour. in terms of convenience, comfort, delivery service, food choices and rating.

Shantashree Das, Debomalya Ghose (Dec 2019) stated in his paper "Influence of Online Food Delivery Apps on The Operations of The Restaurant Business" how technological evaluation changed scenario of restaurant enabling customer to order food more comfortably from home., benefits of joining online food delivery app to boost businesses and inventory management of restaurant. She also listed issues faced by restaurant and the things keep in mind while providing better customer services.

Dr. Sonali Jadhav (IJLTEMAS) highlighted the factors responsible for growing online food delivery business. I internet penetration, Necessity of Smartphone in today's life and forcing of restaurants to explore delivery options to increase business in competition.

Anupriya Saxena gave insight about the emerging innovative technologies used in restaurant and strategies which are followed by online food app companies like swiggy and Zomato, drivers of the online food app sites in her paper "An Analysis of Online Food Ordering Applications in

Saroj Kumar Koiri, Subhadeep Mukherjee (Dec 2019) reveals the factors impacting customer perception about online food delivery apps. With the help of systems, restaurants can provide better services and fulfil customer's demands.

SayaliKhedikar, Shreya Baghee (April 20) mentioned in her "Digital food ordering system for restaurants" that how tablet food ordering technology is playing important role in food ordering from table than traditional ordering food system in restaurant. With tablet, customer can login his credentials and pick up his desired meal which goes directly in kitchen. This technology helps in fastening the meal ordering and reduce error.
AbhishekSingh, Aditya R, Vaishnav Kanade (June 18) mentioned about user centered system formed by them in paper "Online food ordering system", which is hassle free and how customers can track their order with feedback or rating system.

T. Deepa, P. Selvamani (Dec 18) stated about online food ordering system help and solve customer problems and making order so easily.

Objective of the Research
1. To study the concept of online food delivery apps.
2. To identify the perception of QSR customer with merits and demerits towards food delivery app.
3. To analyze factors influencing ordering food online

Research Methodology
The online food ordering concept is growing very fast benefitting food ordering app companies as well as the restaurants associated with them. The present study is descriptive in nature and both quantitative and qualitative methods are used for data collection. The study scrutinizes the responses which are collected from quick service restaurant outlet and customers.

Primary Data collected from the questionnaire filled by customers who is visiting various quick service restaurants and order food by online apps. The type of questions asked were regarding perception of quick service restaurant customers towards ordering food online and understanding merits and demerits.

Secondary Research: It is collected from the research papers, blogs, Magazine, Internet on the concept of food delivery app.

Data Analysis and Interpretation
Ordering food online nowadays became a fashion in today era. Ordering food online is very comfortable and saves time and energy. The information is collected from respondents of Pune city. It has been found that ordering food online is growing day by day with the rise in number of outlets providing mouth melting delicious food within limited period of time. Food delivery business has a huge market which is highly demandable. People like to try food variety from various quick service restaurants.

Demographic profile of Sample Respondents
General individual information related to age, gender, marital status, education, income taken from respondent were analyzed and the results are shown as below.

1.1 Age
It is a very important demographic factor in determining individual person attitude, behavior, decision making etc. Age wise distribution of sample respondent is shown as below graph.
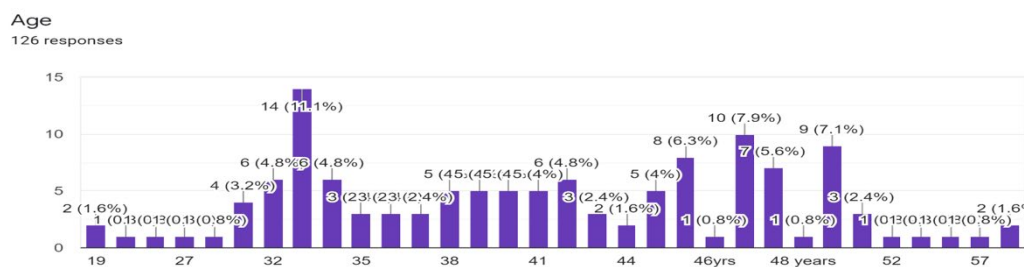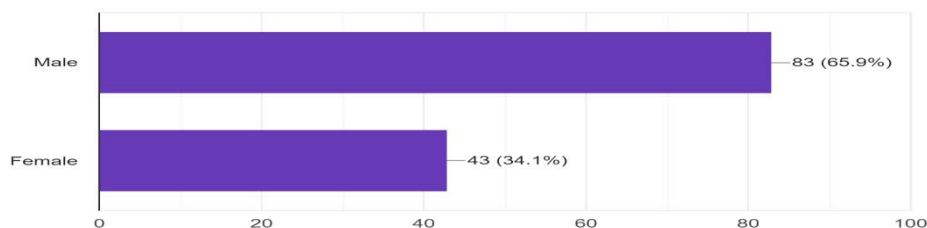
Sr no	Age (In Years)	Percentage
1	25 – 35	30 %
2	36 – 45	33.33 %
3	46 – 55	32.53 %

From above graphical presentation, it can be seen that QSR is popular in all age group
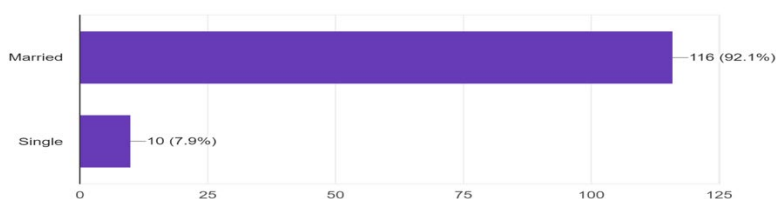
1.2 Gender

Gender is important to understand lifestyle behavior related to food habits as they have diverse attitudinal and behavioral direction.

1.3 Marital status

The Marital status of sample respondent play important role in spending on ordering fast food online. Many family personnel order food online as it is demand from kids or spouse.
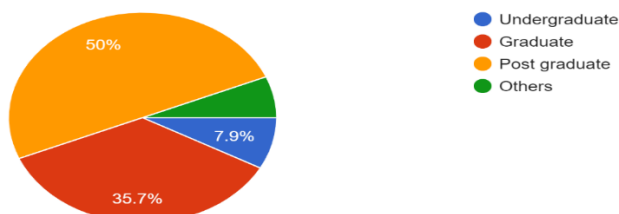
1.4 Education

Education plays an important role in ordering food online in their approach and attitude toward spending. The educational status of sample respondent is presented in following table.

Table: Educational status of sample Respondent

Sr. No	Education	Percentage
1	Post Graduate	50
2	Graduate	35.7
3	Undergraduate	7.9

1.5 Monthly Income

Monthly income
126 responses

The responses of customers regarding perception towards ordering food online were as below

Income of consumer plays significant role for decision making in ordering food by online apps and the results are presents in table

Table: Monthly Income of sample respondent

Sr. no	Monthly Income	Percentage
1	Below 20000	10.3
2	Between 20000 - 30000	16.7
3	Between 30000 - 40000	17.5
4	Between 40000 - 50000	13.5
5	Above 50000	36.5

I learned about Online food ordering app from......
126 responses
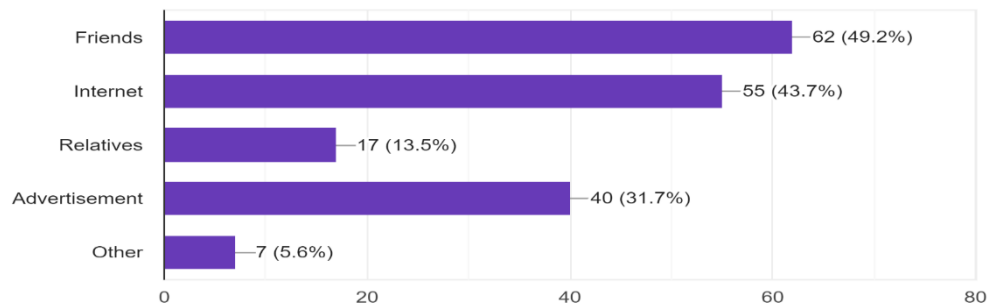
Most of customers learned ordering food online through friends, Internet, social media, and advertisement

My most preferred online food ordering app is.........
126 responses
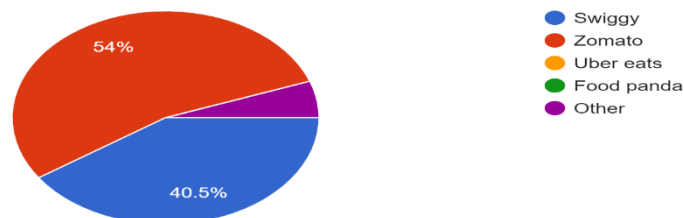
54 % of total respondents prefer Zomato app for ordering food online
Whereas 40.5 % respondents they prefer Swiggy app which stand at second position for ordering food online app by the customers.
5.5% of the respondents use other app for ordering food online.

Frequency of ordering online food
126 responses

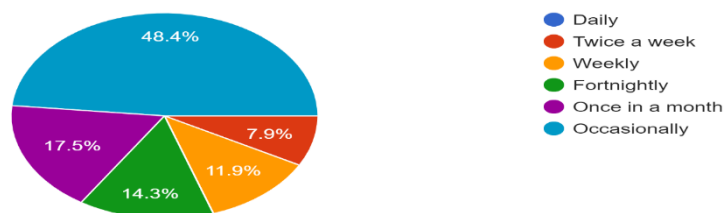

- Daily
- Twice a week
- Weekly
- Fortnightly
- Once in a month
- Occasionally

48.4% people order quick service food occasionally, whereas 11.9% people order food weekly, 14.3 % fortnightly, 17.5% people order food once in month

Reason for ordering food online
126 responses
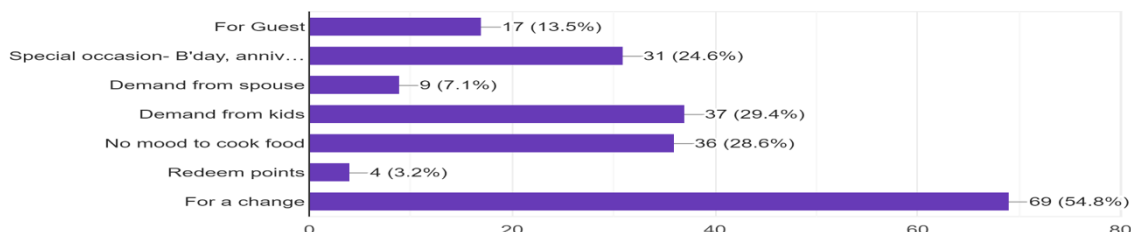
The most common reason for ordering food online is for a change. Whereas other reason found are no mood to cook the food and demand for ordering food online by kids.

Most preferred day to order food online
126 responses
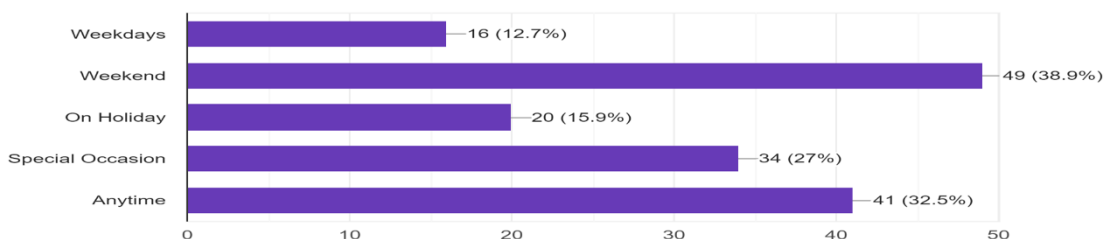
Weekend is usually a most preferred day to order food. As we can see there is increase in demand for ordering food online, most of customers order online food anytime and usually on some special occasion.

The brand of fast food influence me while placing food order online
126 responses

- Strongly Agree
- Agree
- Neither agree/dis-agree
- Dis agree
- strongly dis agree
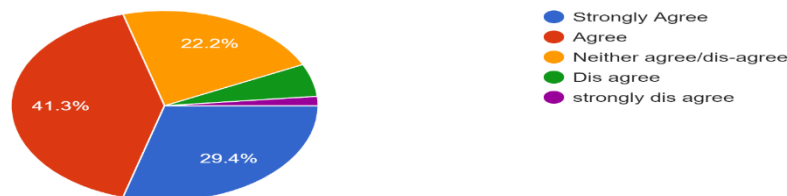
It has been seen that brand is mostly considered while ordering food online. But nowadays other standalone quick service restaurants also provide good food.

Online food order fulfill my needs like taste, food quality, food satisfaction etc.
126 responses

- Strongly agree
- Agree
- Neither agree/dis agree
- Dis-agree
- Strongly dis agree

19.8%
7.1%
58.7%
14.3%
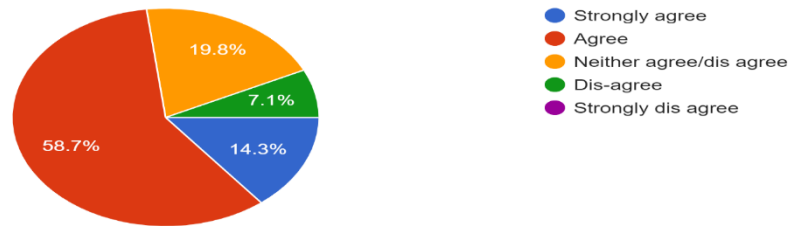
It has been seen that people are very much happy with the online food ordering in terms of taste, quality of food and food satisfaction. This will help in growing online food ordering business.

I prefer to order food through online apps only to QSR/Fast food restaurant I have visited before.
126 responses

- Strongly agree
- Agree
- Neither agree nor disagree
- disagree
- Strongly disagree

23%
11.9%
44.4%
17.5%

It has been seen that customers like to order food through online app to which they have visited earlier as they are familiar with the taste of food.

I consider the hygiene and sanitation commitment of fast food/quick service restaurant before ordering food online
126 responses

- yes
- No
- Maybe

89.7%
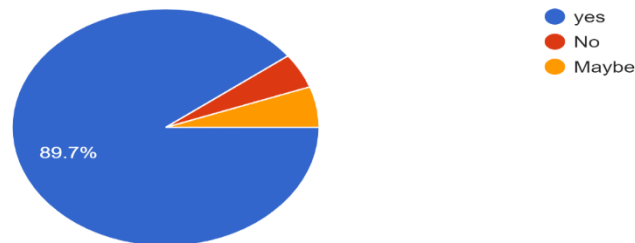
Nowadays customers are becoming very cautious about hygiene and sanitation. They like to order food were quick service restaurant follows hygiene and sanitation standards.

Do you give review of online ordered food
126 responses

- Yes
- No
- Maybe

15.1%
22.2%
62.7%
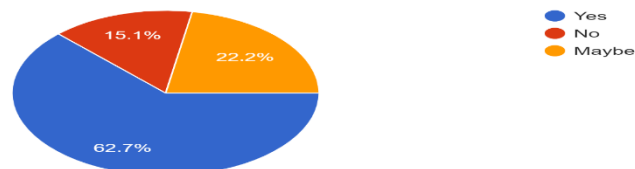
62.7% of customers share their review about food to online food order apps.

Does discount or offers change your mind when ordering food online
126 responses

Legend: Yes, No, May be

Slices: 24.6%, 23%, 52.4%
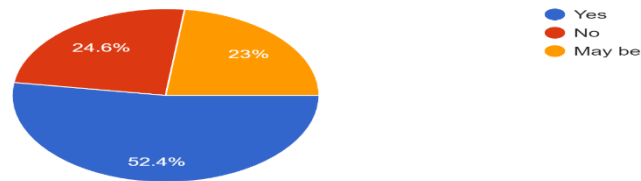
52.4% of customers are agree that discount and offers are considered while ordering online food.

Average money spent on online food orders per month
126 responses

Legend: below 1000, Between 1000 - 2000, Between 2000 - 3000, Between 3000 -4000, Above 4000

Slices: 31.7%, 13.5%, 49.2%
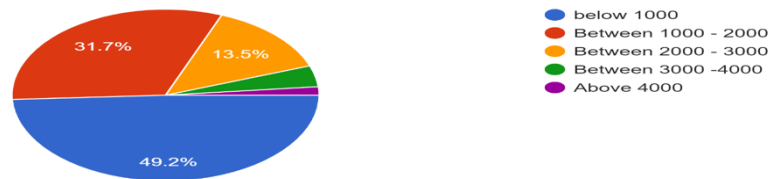
On an average Rs. 1000-2000 money are spend in a month to order online food.

Most preferred QSR food ordered online
126 responses

Item	Count
Pizza	89 (70.6%)
Burger	45 (35.7%)
Sandwiches	32 (25.4%)
Rolls	31 (24.6%)
Beverages - Milkshake, cold co…	18 (14.3%)
Pasta	22 (17.5%)
International food	23 (18.3%)
Sweet - Pastry	16 (12.7%)
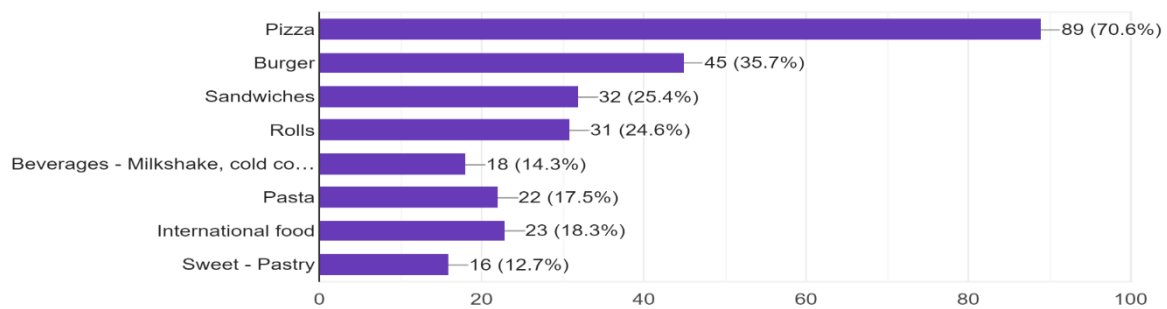
From above it is clear that Pizza, Burger, Sandwiches, Rolls are the most favorite quick service restaurant food items in online food orders.

The online food delivery app provide the food delivery in their committed time.
126 responses

Legend: strongly Agree, agree, neither agree/disagree, Disagree, Strongly dis-agree

Slices: 12.7%, 63.5%, 20.6%

From above customers are happy that 81% people agree that food delivery app provide food delivery in committed time.

Problems faced after receiving online food orders
126 responses
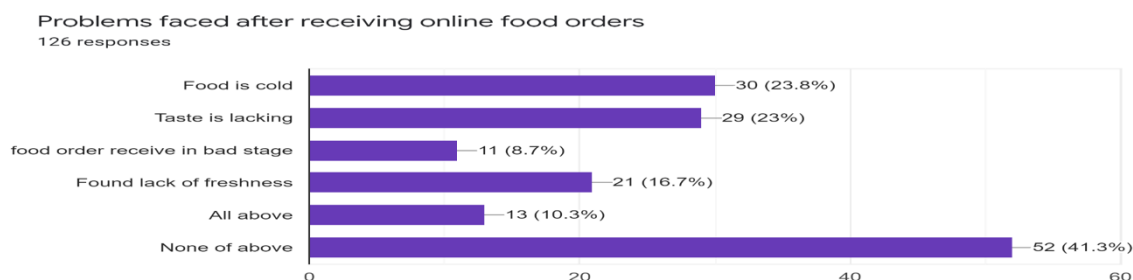
41.3% customers are happy with the service and quality of ordered online food. Whereas few customers facing problem of food become cold, food lack in freshness & taste. Sometimes quick service orders receive in bad stage too.

Technical problems faced while ordering food online
126 responses
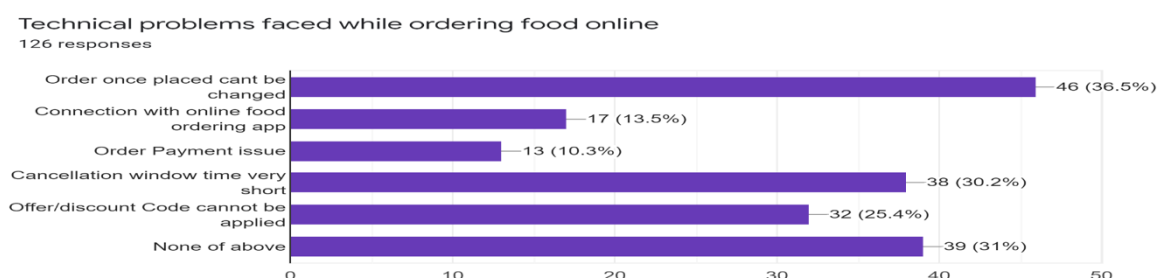
Ordering food online is very easy and more convenient. Still major problem faced by customer is order once placed cant be changed, some customers face problem in applying code of discount or offer.

Suggestions
- Online food delivery is expensive, and they should charge less commission to the restaurants so that the food is available at relatively more reasonable rates.
- Online food delivering restaurants should be more concerned about packaging to keep the food hot for longer time. Fast Food restaurant needs to improve the packaging quality so that it will not hamper food.
- Online ordering app companies should provide more wide range of coverage as the city and development are taking place.
- More food options should be available for special occasion like birthday or anniversary which can be remembered.
- Restaurants should be more concern towards providing standard portion size as per price. Give value for money and need to improve delivery speed.

Limitations
- Pick up and drop both location/addresses given for home or work do not match with actual delivery location.
- Customer reviews not visible directly while ordering.
- Online app companies so far are doing great job but still unable to manage large traffic during peak hours, so may need to find solution for this.

Conclusion
The study was focused on identifying the factors that impact on consumer perception on online food ordering. People from Pune region selected for this study, and it is found that the customers of all generation like quick service restaurant food. They are very much happy with the online food ordering as nowadays ordering food online it became a fashion and status symbol.The future of online food ordering is seen brighter in future and lot of job opportunities will be available. The study revealed that apart from quality of quick service restaurant food, other factors like discount, offers, hygiene and sanitation are key factors considered while ordering online food order. Usually most of customers order food from the place they visited earlier. More numbers of online food orders usually found weekend and special occasions. Pizza is the most favorite online ordering food in quick service restaurant followed by burger, sandwiches, rolls, fries, cold coffee etc.

However, there are certain areas which need to be focused by quick service restaurant like providing hot food to customers, maintaining same freshness in food like how it has been served in restaurants. Most of the times customer receive product in a very bad condition, so there is a need to improve packaging. There is also need to do advancement in online ordering food which become very convenient for customers to order food online.

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Trupthi B, Rakshitha Raj, J B Akshaya (July 19) Online Food Ordering System, (IJRTE) ISSN: 2277-3878, Volume 8, Issue 2S3

A STUDY ON WORK LIFE BALANCE AND ITS IMPACT ON EMPLOYEE JOB SATISFACTION

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ABSTRACT
In today's society, the concept of work-life balance has become increasingly important. Work-life balance is the ability to maintain a healthy, productive lifestyle despite the demands of work. The benefits of establishing a work-life balance are numerous. Employees who maintain a healthy work-life balance are frequently happier in their employment and are less prone to becoming burned out. Furthermore, those who maintain a healthy work-life balance frequently exhibit better levels of productivity and creativity. The objective of this research is to study the impact of work life balance on job satisfaction of employees. The researchers have collected the data from 100 employees working in banking sector using survey method with the help of well-structured questionnaire. The researchers identified that descriptive research design and Non probability convenience sampling method is suitable for the research study. The findings of this study will be useful banking industry to design new policies for employee engagement.
Keywords: Work Life Balance, Job satisfaction, Workplace, Banking sector.

Introduction
Concept of Work Life Balance
Work-life balance is a concept that has been gaining traction in recent years. With the ever-growing demands of the modern workplace, more and more employees are finding themselves struggling to maintain a healthy balance between their work and personal lives. This can lead to increased stress levels, which can in turn lead to decreased job satisfaction and productivity.

There are a number of ways to help promote work-life balance within your organization. You may help your workers maintain a good balance between their professional and personal lives by encouraging flexible work arrangements, making childcare or eldercare services available, and providing employee assistance programs, to name just a few strategies. Promoting work-life balance can increase productivity, employee retention, and job satisfaction. Work-life balance is a well-known contributing element to employee job satisfaction. Work-life balance is a strong predictor of employee engagement, according to new research. A healthy work-life balance can lead to happier, more productive employees who are more engaged in their work. This, in turn, can lead to better business outcomes for employers.

Past, Present and Future Scenario of Work Life Balance
It is no secret that the demands of work can often conflict with the demands of life outside of work. In fact, a recent study found that nearly two-thirds of employees feel like they have not achieved a good work-life balance. And, not surprisingly, this lack of balance can have a negative impact on job satisfaction. Employees who don't feel like they have a healthy work-life balance are more likely to be dissatisfied with their jobs, according to a survey by the Society for Human Resource Management (SHRM). Additionally, they are more likely to be disengaged at work and to claim that they would quit their current position if given the chance. Interestingly, the earlier studies found that it is not just employees with young children who struggle to achieve a good work-life balance. In fact, employees without children are just as likely to say that they struggle to find time for things outside of work as those with children. So what can employers do to help their employees achieve a better work-life balance? The SHRM study identified a number of practices that can make a difference, including:

- Offering flexible work arrangements, such as telecommuting or flexible hours Encouraging employees to take advantage of paid time off (PTO) and vacation days
- Providing resources and support for employees who are struggling to juggle work and life demands

Strategies for maintaining Work Life Balance
There are many different strategies and tools that can be used in order to help achieve a better work-life balance. Some of these include: Time management – This is a key tool for achieving a better work-life balance. Time management can help you to make the most of your time, and ensure that you are able to get the right balance between work and other aspects of your life. Flexible working – Flexible working arrangements can be a great way to achieve a better work-life balance. They can allow you to fit work around other commitments, such as

caring for family or studying for qualifications. Job sharing – Job sharing can be another way to achieve a good work-life balance.

It involves two people sharing one job between them, and can allow you to have more time for other things outside of work. Taking regular breaks – Taking regular breaks during the day can help you to avoid burnout and maintain a good work-life balance. Breaks give you time to recharge your batteries and come back to work refreshed and ready to focus.

Challenges for maintaining Work Life Balance

The earlier studies found that employees who don't feel like they have a good work-life balance are more likely to experience burnout, which can lead to a decrease in job satisfaction. Burnout can occur when an employee feels like they're not able to take care of their personal life because of their job. This can happen when an employee works long hours, has little time for breaks, or feels like they're constantly under pressure. Employers must foster a work climate that encourages their staff to maintain a good work-life balance. Workplace productivity, creativity, and commitment are all more probable among employees who believe they have a healthy work-life balance.

Opportunities in maintaining Work Life Balance

There are a few key things that employers can do to help their employees maintain a healthy work-life balance. First, employers should provide flexible working arrangements whenever possible. This could include things like flexible hours, telecommuting, or compressed work weeks. Second, employers should encourage their employees to use their paid time off and make it easy for them to do so. Finally, employers should create culture of respect and understanding for employees' personal time commitments outside of work. By taking these steps, employers can create an environment that supports their employees' efforts to maintain a healthy work-life balance. In turn, this can lead to happier, more satisfied, and more productive employees.

From the perspective of keeping people within the company, job satisfaction is crucial. In modern firms, high job satisfaction successfully contributes to increased organisational productivity, lower employee turnover, and lower levels of workplace stress. Work-life balance is influenced by a variety of elements for each individual in the company. In order to explore and comprehend the work-life balance, this research is conducted with the staff members of private sector banks.

Literature Review

According to our survey, 50% of people are not happy with their jobs, which prevents them from maintaining a healthy work-life balance. Our research also indicates that people who work long hours may not be happy at their professions, which makes it difficult for them to maintain a healthy work-life balance. They struggle to find time for their personal lives, which makes them unhappy at work. The outcome also demonstrates how changes in gender and marital status have an impact on work-life balance. Regardless of gender, sexual orientation, or marital status, each individual has their own way of living. Work-life balance varies depending on one's patterns and practices in life, Muhammad Shadab, and KashifArif (2015).

According to the results, employees who have lower job satisfaction and encounter work-life conflict are more likely to consider leaving their employment if they have a low degree of commitment to remaining in their existing positions. In fact, those who see few career choices are less likely to have a strong intention to leave, even when they suffer a work-life balance imbalance or workplace discontent. Since it demonstrates that employees' low desire to quit their jobs is not necessarily an indication of job happiness or a positive work-life balance, this study has consequences for managers. Most people who encounter work-life balance issues or job dissatisfaction are compelled to continue working for their existing employers out of necessity. It is encouraged that managers test employees' levels of job satisfaction on a regular basis. When they see work-life conflict and job dissatisfaction, managers must take action to support employees in finding a balance between their personal and professional lives, MarjanFayyazi, and Farshad Aslani (2015).

Work-life balance and job satisfaction are positively correlated. The firm should set up its workplace so that its workers can work from home and spend more time with their families. Due to this flexibility, employees are happier and report higher levels of job satisfaction (Gayathiri&Ramakarishnan, 2013). Additionally, Guest (2002) found that WLB practices like making family responsibilities part of the job make employees happier and more satisfied because they can balance work and family obligations. Employers should provide their workers with benefits that let them spend time with their families, such as paid time off, healthcare, sports facilities, and entertainment programs. They should also adopt work-life rules that give people high levels of happiness and promote good performance. Employees are motivated to work better when they have satisfactory WLB arrangements, which boosts business earnings, A.ArunaShantha, (2019).

Work-life balance is a key issue in human resource management since it has an impact on both individuals productivity and the development of their business. The achievement of work-life balance by employees is facilitated by a variety of circumstances. To ensure that workers' professional and personal lives are highly balanced, various factors, such as employee involvement in formulating policies and making important choices, can be reinforced, Dr. K. Veena Latha (2019).

Work-life balance has become a pressing human resources issue for the business world, and while the majority of organizations have addressed these issues with a variety of policies and programs that address specific family needs, these programs still uphold the idea that a worker's job and personal life are distinct from one another and incompatible. Faculty members frequently disrupt the productive workplace and set the lowest standards by struggling to balance their personal and professional obligations. Programs that promote work-life balance have the ability to significantly boost employee morale, retain organizational knowledge, and lower absenteeism, particularly in hard economic times. Universities and colleges are under intense financial pressure; therefore, comprehending the important concerns of work-life balance falls to the institution's HR professionals. Faculty members' work-life balance at the engineering institutions that were assessed falls short of the desired level of satisfaction. Work-life balance and job happiness are strongly associated, and managerial support is crucial in illuminating faculty members' job satisfaction, Dr.P.Jyothi, Dr.C.Sonia, Dr.B.Rajasekar, D.Krishnamoorthy, S.Ramanathan (2020)

Organizations place increasing value on the collaborator as an individual, so it is critical that they provide well-being and implement initiatives that support their collaborators' professional satisfaction and allow them to feel fulfilled on both a personal and professional level, fostering the possibility of family time. The purpose of this study is to ascertain what factors affect professional happiness and if employees can strike a balance between their working and personal lives. Having said that, the findings demonstrate that for employees to feel professionally fulfilled, they must be integrated into a stable and healthy organizational environment. Additionally, the employee's commitment to the organization plays a crucial role as a mediator of the relationship between the aforementioned variables, Renato Lopes da Costa et al (2020).

Work-life balance is not a brand-new concept in human resource research, so there will always be new studies on it. The results of this study show that work-life balance is positively correlated with employee retention (up to 4.4%) and job satisfaction (up to 8.3%). Employers can use corporate-designed training and development programs to match an employee's talents to a position within the company that suits their interests and gives them the opportunity to advance. As a result, it could also assist you in creating close relationships with your employees. In order to help employees better balance their personal and professional lives, employers often provide them with the option to work from home, Hana Silaban, and Meily Margaretha (2021).

Poor work-life balance has a detrimental influence on both employee performance and productivity (Naithani, 2010). But those who manage their work and personal lives well do better in their employment (Roberts, 2008; Ryan and Kossek, 2008). In this regard, our data show that there is a positive correlation between work-life balance and job performance, with a coefficient of 0.152 (T-statistic = 3.007) indicating that this association is significant. These scientific findings also imply that a better work-life balance will improve an employee's ability to accomplish their job duties. The study's participants discussed their willingness to be adaptable at work when necessary and stressed that they were not prepared to give up their personal lives for their jobs, Perengki Susanto et. al. (2022).

Research Methodology
Objectives of the study
- To study the concept of work-life balance and job satisfaction.
- To identify the impact of work life balance on employee job satisfaction.

Hypothesis of the Study
H1: There is a significant impact of work life balance on job satisfaction of employee.
Scope of the study
- The study is conducted across Pune, Nagpur and Nanded City.
- The study is related to only employees working in banking sector.

Reliability and Validity
Questionnaire is found reliable as Cronbach's Alpha identified is 0.820, and it is more than 0.700.

Research design

Type of Research Design	Descriptive Research Design
Sampling Technique	Non-Probability Convenience Sampling
Sampling Area	Pune, Nagpur, Nanded
Sample Size	100 employees
Primary Data	Well-structured questionnaire
Secondary Data	Research papers, Articles, Books, Journals etc.
Data Analysis tools	IBM SPSS-20 and Ms Excel-2010

Data Analysis

Age of the Respondents

Seri1; 51 & above; 10; 10%
Seri1; 21 to 30; 20; 20%
Seri1; 41 to 50; 42; 42%
Seri1; 31 to 40;…

■ 21 to 30 ■ 31 to 40 ■ 41 to 50 ■ 51 & above

Gender of the Respondents

Seri1; Female; 34; 34%
Seri1; Male; 66; 66%

■ Male ■ Female

Marital status of the Respondents

■ Married ■ Unmarried

Seri1; Unmarried; 26; 26%

Seri1; Married; 74; 74%

Income of the Respondents

Seri1; Above Rs.15,00,000; 20; 20%

Seri1; Below Rs. 5,00,000; 10; 10%

Seri1; Rs. 10,00,000 to Rs. 15,00,000; 24; 24%

Seri1; Rs. 5,00,000 to Rs. 10,00,000; 46; 46%

■ Below Rs. 5,00,000
■ Rs. 5,00,000 to Rs. 10,00,000

Managerial Level of the Respondents

Seri1; Lower Management; 16; 16%

Seri1; Upper Management; 16; 16%

Seri1; Middle Management; 68; 68%

■ Upper Management   ■ Middle Management   ■ Lower Management
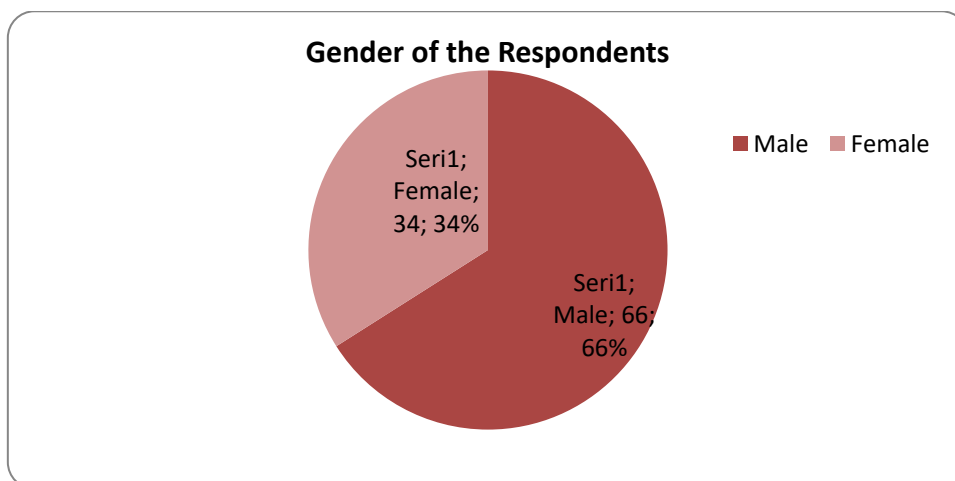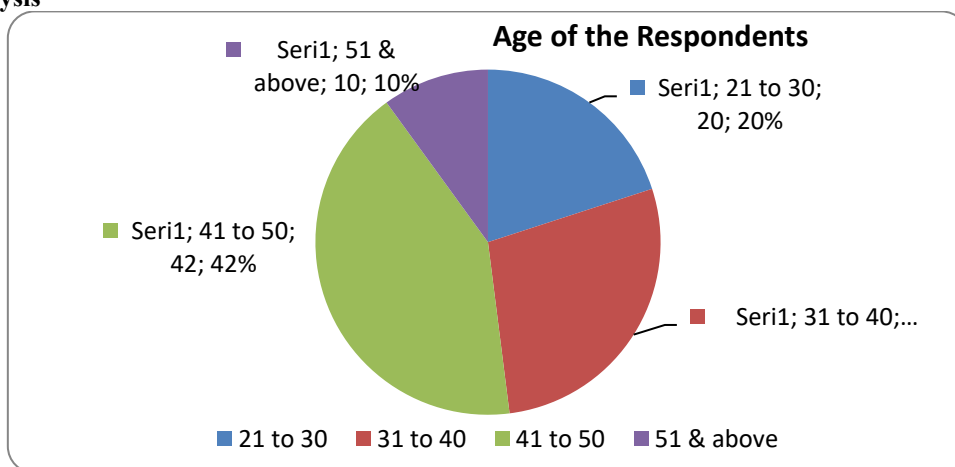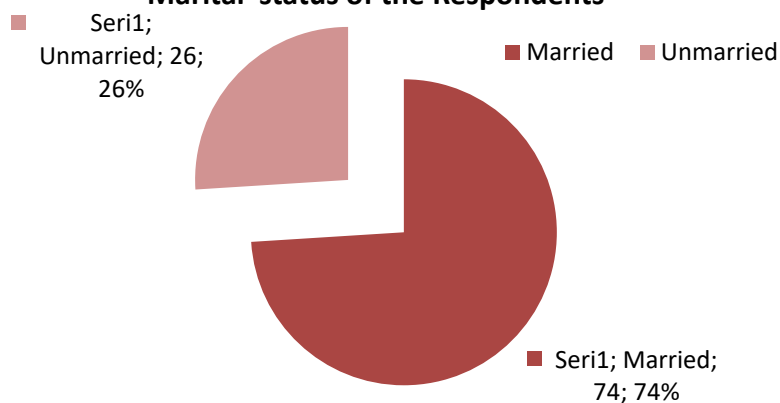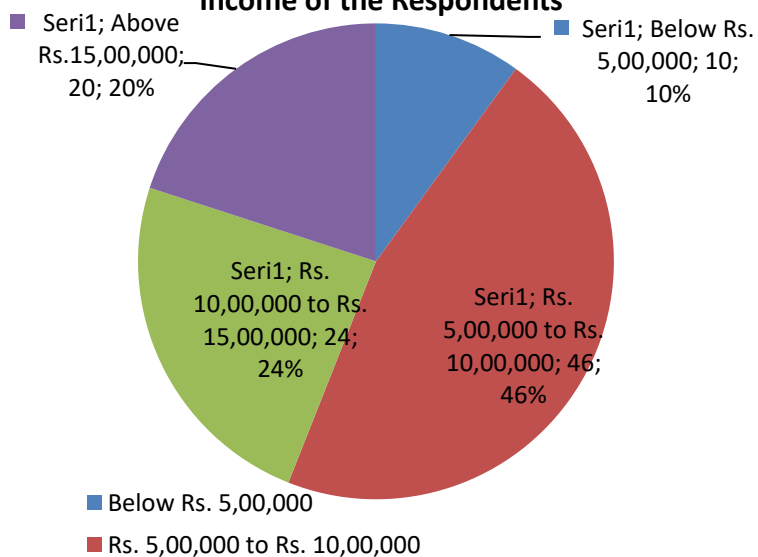
Work Tenure of the Respondents
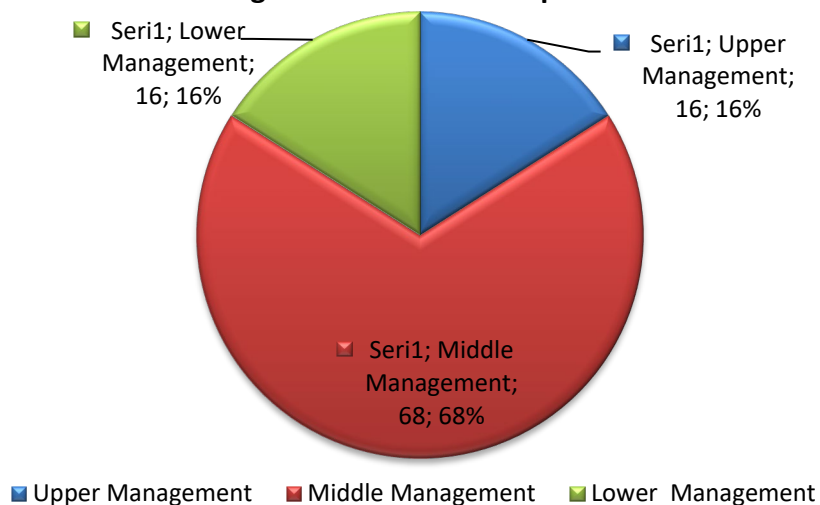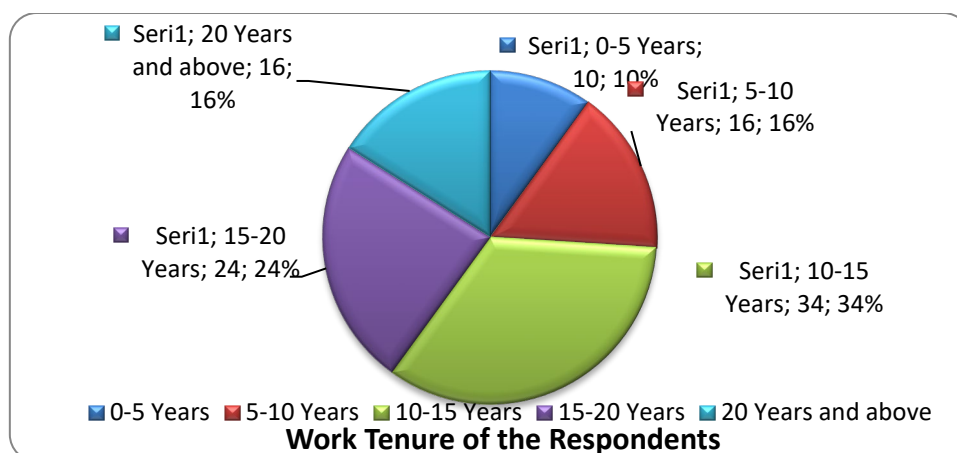
Employee opinion about impact of work life balance on job satisfaction

5 Point Rating scale	Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly satisfied

Impact of Work Life Balance on Job Satisfaction of Employee based on their Gender

	Mean
Gender	
Male	4.13
Female	3.76
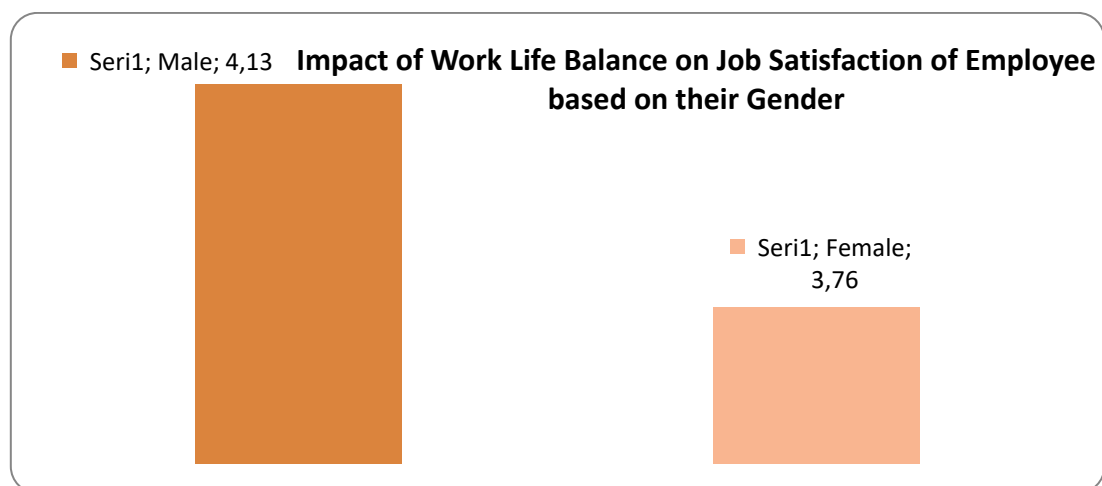
Impact of Work Life Balance on Job Satisfaction of Employee based on their Marital Status

	Mean
Marital status	
Married	3.28
Unmarried	3.88

Impact of Work Life Balance on Job Satisfaction of Employee based on their Marital status

Seri1; Unmarried; 3,88

Seri1; Married; 3,28
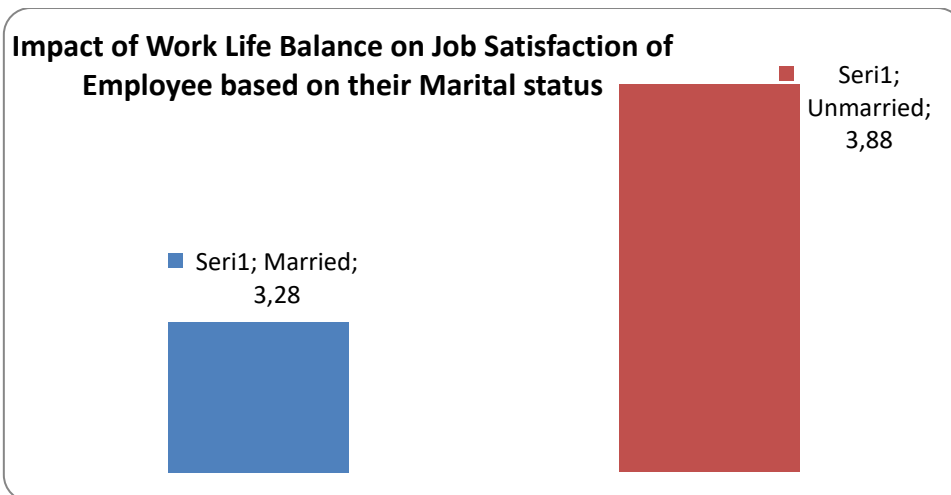
Impact of Work Life Balance on Job Satisfaction of Employee based on their Work Tenure

Work Tenure	Mean
0-5 Years	4.23
5-10 Years	4.12
10-15 Years	3.25
15-20 Years	4.29
20 Years and above	4.11

Impact of Work Life Balance on Job Satisfaction of Employee based on their Work Tenure

Seri1; 0-5 Years; 4,23

Seri1; 5-10 Years; 4,12

Seri1; 10-15 Years; 3,25

Seri1; 15-20 Years; 4,29

Seri1; 20 Years and above; 4,11
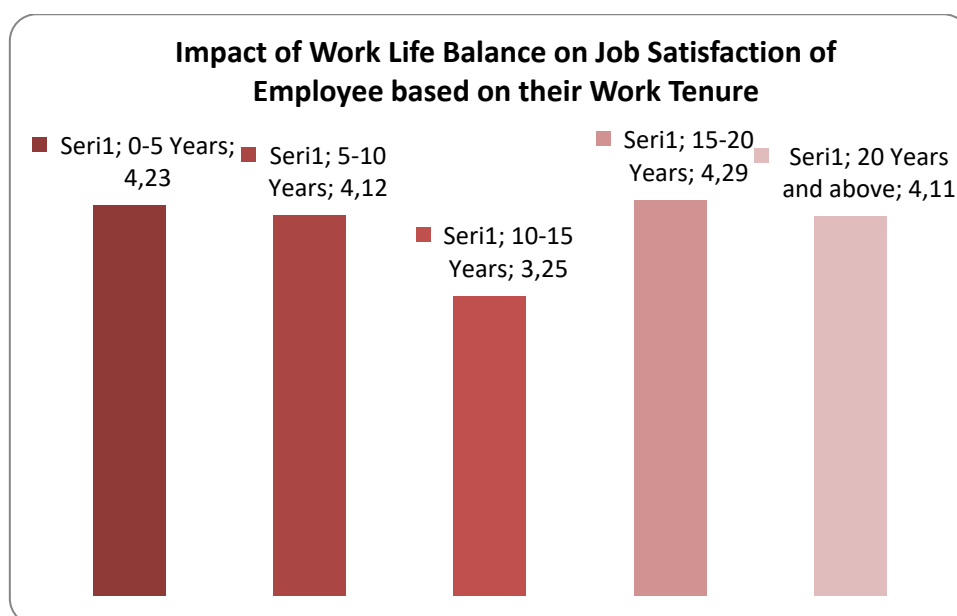
Hypothesis Testing

Predictor	Job satisfaction		
	β	t	sr^2
Age	0.05	0.5	
Gender	0.15	-1.47	
Marital status	0.16	1.64	
Tenure	0.13	1.109	
NWHI	-0.29	-2.48	0.05
PWHI	0.41	314	0.07
NHWI	0.19	1.68	
PHWI	-0.01	-0.05	
Overall work-life balance	0.00	0.02	

			N	Mean	SD	Levene's test for equality of variance	t-test for equality of means		Cohen d
Variable	Biographical group		N	Mean	SD	Fp	t	df	
Overall job satisfaction	Marital status	Married	74	3.28	0.61		2.85		
		Unmarried	26	3.88	0.78	1.09		98	0.68
Overall job satisfaction	Tenure	<15 years	60	3.94	0.84		3.82		
		>15 years	40	4.14	0.92	1.02		98	0.86

- N = 100, $p \le .001$; ** $p \le .01$; * $p \le .05$.
- NWHI: negative work-home interaction;
- PWHI: positive work-home interaction;
- NHWI: negative home-work interaction;
- PHWI: positive home-work interaction.
- From the above study it is identified that the null hypothesis H0: Work life balance has no impact on job satisfaction of employees is rejected at 5% significance level and the alternative hypothesis H1: There is a significant impact of work life balance on job satisfaction of employees is accepted as the p value observed is less than 0.05.

Conclusion

From the present research study it is observed that there is a significant impact of work life balance on job satisfaction of employees.

Contribution to Industry
This research study will be helpful to organizations to design new strategies related to work life balance which will be beneficial to improve employee job satisfaction.

Contribution to Academicians
This research study will be helpful to academicians to develop theoretical models related to work life balance and job satisfaction.

Contribution to Students
This research study will be helpful to students to understand the concepts like employee engagement, work life balance and job satisfaction etc

Scope for the further research study
There is also a further scope for the research to study the impact of work life balance on job satisfaction on sectors other than banking industry, researchers can also to further study on work life balance and employee engagement etc.

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AN EMPIRICAL STUDY ON FACTORS RESTRICTING INVESTMENT DECISION OF WOMEN INVESTORS IN THE INDIAN STOCK MARKET

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Abstract:
This study aims to identify the factors that restrict female investors from investing in the stock market. 250 working women in Pune City, Maharashtra State, were considered for the study. The present study is exploratory in nature. A comprehensive questionnaire was created after researching previous literature to determine the 24 elements that were restricting the investment decisions. Even though women are leaders in every aspect of life, they still fall behind when it comes to stock market investment. Women are still bound to several social constraints, which have become a part of their personality and attitude.
In addition to this, the prevalent social norms, spiritual beliefs, and cultural values prevent women from making risky investments and put restrictions on their ability to do so. Considering this, it is an effort to explore the issues preventing women from making stock market investments. The current study is expected to help not only female investors but also various financial institutions, investment consultants, stock broking firms, and other stock market participants in exploring the barriers that restrict the investors to invest in the stock market.
Keywords: Investment decision, Barriers, Indian Stock Market, factor Analysis

Introduction:
With the changing environment, women have actively participated in investing their savings, though it all depends on different factors like their level of risk-taking capacity, the influence of family and friends, and their risk bearing capacity in modern investment avenues. In the last few decades, women's involvement in business and finance has grown significantly. Presently, the woman is equally employed and knowledgeable about many financial and Investment decisions. Women actively participate in all domestic affairs. Now a days, women are independent, educated, and earn respectable salaries. These days, women make financial decisions on their own in addition to domestic ones. Women in India are now actively participating in all activities such as education, politics, media, science and technology, and becoming financial independent Today's women are financially independent and ready to pool their savings in a profitable avenue to maximize their returns.

Since a sizable amount of their savings are invested in India, which has the oldest stock market in Asia, individual investors have a sizable impact on the market. Every investor decision is based on the relationship between risk and reward. Studies on behavioral finance exhibits how emotions and cognitive biases affect individual investors' decisions. Nowadays, the nature of the financial markets has drastically changed. Investing money has become a very complex activity due to the large number of savings and investment companies, the availability of various investment avenues, the terms and conditions of investments, and the rules and regulations Globalization and technological innovation have greatly enhanced the value of investment. The stock market's activities have a significant impact on the rising Indian economy. Due to the high level of market volatility, a lack of sufficient understanding, poor knowledge, and several other problems, the common man is still not aware of benefits of investing in the stock market. The choice of investment avenues is a challenging task which requires extensive skills and knowledge for an analysis of the available options. Furthermore, right investment decision may result in greater returns and overall satisfaction.

However, due to lack of awareness and lack of knowledge, it seems difficult for individuals to analyze the many possibilities to identify good investment avenues. Furthermore, they don't even know where to invest or how much to invest.

Even though women are increasingly inclined to invest in the stock market, they still fall behind males when it comes to picking high-risk stocks. Because they are afraid of losing their money, they usually avoid investing in riskier investments. Women typically favor investing in stocks with stable expected returns. Women are balanced, intuitive, and quality conscious and adopt a futuristic approach. All of these qualities helps women in investment decisions. This study aims to identify the factors associated to women's personal preferences, stock market awareness, and demographics that restrict them from taking risks in the stock market.

Literature Review

Ilusardi et al. (2009) analyzed factors which are restricting stock market investments. 7,138 samples from US showed that investors ignore many aspects while making investment basic reason of poor investment decision. There are various reasons such as lack of awareness, lack of participation and poor borrowing behave of the investors are basic reasons of poor investment decisions.

Kathirvel and Mekala (2010) tried to understand the investment behavior of investors. 150 women from the Tamil Nadu district of Coimbatore participated in the study. According to the findings, women are restricted from investing in the stock market due to lack of knowledge about the stock market. The authors concluded that women investors should be concerned about insecurity and excessive stock market volatility.

Bhatt (2013) tried to understand working women's attitudes about stock market investment. The results showed that working women invest their money in a variety of ways. There was significant relationship between the age of the women and income level, but no significant relationship between education level and investment decision.

Shanthi and Murugesan (2016) aimed to understand the objectives of women investors for investing in stock market. The study was conducted on 60 women respondents in Namakkal district of Tamilndu. The findings showed that women stock market investors invest with the hopes of capital appreciation, security, and stable income. The authors came to the conclusion that working women choose safety and larger returns on their investments over time, but that women still require full awareness, and that the government should take appropriate action hould take appropriate action.

Jisha and Gomathi (2017) examined the relationship between income and investment patterns of respondents who were Coimbatore-based working women. Major objective of the study was to understand how women employees' income and investments related to one another. The findings demonstrated that an employee's wage level has a significant impact on their savings, and that working women priorities safety and consistent returns on their investments. Depending on their personalities, women had varying expectations from investments. For example, the majority of women wanted long-term savings, interest, and capital growth. A sound investing decision, according to the report, is dependent on having the necessary stock market knowledge and expertise.

According to Parihar, Sharma, and Parihar (2009), the majority of respondents had not yet developed any attitudes toward investing in the stock market since they were comfortable using their conventional forms of investment, such as gold, bank deposits, and postal schemes. Lack of knowledge about the stock market and its activity were the main reasons of the low participation in stock market among investors.

Kathirvel and Mekala (2010) tried to investigate investor's behavior. 150 women from the Tamil Nadu district of Coimbatore participated in the study. The findings of the study showed that women's low participation in stock market was due to their lack of stock market expertise. The authors concluded that insecurity and high volatility in the stock market were the issues of concern for women investors.

Kaur and Vohra (2018) tried to understand the reasons that restrict women from trading stocks in India and to determine the importance of these factors in influencing women's stock market involvement. Structured questionnaires were used to collect data. The data was analyzed using factor analysis and binary logistic regression. It is found that women restrict stock market investment due to variety of reasons, including financial difficulties, personal restrictions, psychological barriers, and gender stereotypes. Financial barriers were the main reason from participation among the factors studied. It was advised that policymakers create programmers for the economic advancement of women because women fall behind when it comes to stock market investing mostly due to financial challenges.

Kaur and Vohra (2016) tried to examine the level of awareness of women about the stock market to provide empirical evidence to prove that lack of awareness about the stock market is the reason for lower stock market participation among women. Data was collected through structured questionnaire. Multiorbital logistic regression has been used to analyze the data. In addition to looking at the awareness levels of women, the study's findings revealed that there is significant difference in the awareness level between investors and non-investors. Lack of knowledge is one of the main reasons of women's lower stock market participation. To increase women's participation in stock market, the paper suggests that education and awareness camps should be organized, especially for women.

Kaur and Vohra (2012) analyzed the different barriers that restricted women from stock market trading. The results showed that women's stock market participation was constrained because of their lack of stock market knowledge and education. The authors concluded that women should be given specific and relevant information to ensure proper stock market investment. There should be a various initiative should be taken such as holding educational workshops to inform people about the different investing options.

According to Jain (2019), the majority of investors prefer to invest in mutual funds, bank deposits, and postal savings. Due to lack of awareness, they couldn't invest in the stock market. Investor behavior is influenced by a number of factors such as opinions of family members', media coverage, religious reasons, the nature of the business, a company's reputation, its dividend policy, lack of awareness, age, government regulations, and financial status.

Maini (2009) evaluated awareness of women about stock market investments. A random sample of 500 women investors of Punjab and Chandigarh was selected. The findings showed that the majority of female investors were knowledgeable about the intricacies of the stock market and the associated risk. Women investors were knowledgeable about the risks and subtleties of the stock market. Women investors were more satisfied and had a more favorable outlook on the stock market, but they were also less familiar with new instruments and regulations.

Objective of the study:
The main objective of this study is to identify the factors restricting women from investing in the stock market.

Research Methodology:
The present research is an exploratory study and was conducted during January-August 2019. A modified questionnaire was used to identify the factors restricting the investment decision of women in the stock market based on 23 factors; 250 working women from Pune participated in the study. Convenience sampling technique was used to select the sample. A total of 250 questionnaires were included in the study after eliminating the incomplete responses. The questionnaire was divided into two parts: the first part consisted of demographical variables and the second part consisted of 23 factors based on the 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Moreover, secondary sources including online research publications, books, working and discussion papers were also used. To analyze the data, factor analysis is applied using SPSS.

Data Analysis and Results
Table1: Demographic Profile
Following table shows demographic profile of respondents.

Sr. No	Factors		Percentages
1	Age	Less than 30 Years	28%
		30-40 Years	44%
		40-50 Years	20%
		Above 50 Years	8%
2	Educational Qualification	Under Graduates	22%
		Graduates	33%
		Post Graduate28	45%
3	Marital Status	Married	69%
		Single	31%
4	Occupation	Salaried	49%
		Own Business	32%
		Professionals	19%
5	Income	Below 40000	18%
		40000-60000	22%
		60000-80000	47%
		Above 80000	15%

Source: Primary Data

Above table reveals that about 28% of the women respondents were of age less than 30 years, 44% of women belonged to age group of 30-40 years, 20% of women were in the age group of 40-50 years, and 8% women belonged to the age group of above 50 years. With respect to qualification, 22% were under graduates, 33% were graduates and 45% held post graduate degrees.

Out of total respondents, 69% were married and 31% were single. With regard to occupation, about 49% of the respondents were salaried, 32% of women were doing their own business, 19% women were professionals. With respect to income, 18% women respondents had monthly income below Rs. 40000, whereas 22% fell within the Rs 40000- Rs. 60000income bracket. Only 47% of women had monthly income of Rs 60000- Rs 80000. Nd around 15% of the women respondents having income above Rs. 80000.

Table 2 - Descriptive Statistics

Sr. No	Reasons that restrict women from investing in the stock Market	Mean	S.D
1	Lengthy procedure of stock market	3.817	1.16
2	Complex formalities of stock market	3.920	1.21
3	Lack of awareness	4.027	0953
4	Unpredictability in stock market	4.072	.894
5	Low Liquidity	4.200	.789
6	Risk of capital Loss	3.937	.900
7	Lack of financial resources	3.890	1.065
8	Time constraints	3.862	1.044
9	Brokers don't provide necessary assistance	3.815	1.220
10	Difficulty in consulting with financial Advisor	3.920	.945
11	Risk averse attitude	3.742	1.203
12	Family Restrictions	4.090	.896
13	Insufficient technical knowledge	4.065	.885
14	Inefficient grievance handling system	3.992	.845
15	Non-availability of reliable information	4.167	.843
16	Difficult to trust financial advisor	3.930	.907
17	Decision related dependency on others	3.915	1.063
18	Unsupportive environment	3.962	1.037
19	Religious and cultural issues	3.84	1.154
20	Language barriers	4.112	.876
21	High brokerage charges	4.087	.852
22	Delay in transfer of shares	3.975	.837
23	Low growth	4.180	.821

Source: Primary Data

Above table shows Mean and S.D. of the factors restricting women from investing in the Stock Market. The Mean lies between 3.742 and 4.200. S. D. lies between 0.789 and 1.210.

Table 3:

Cronbach's Alpha	No. of items
.801	23

Source: Primary Data

Above table indicates that the overall Cronbach's Alpha for the 23 item scale is .801, proposing that the items have relatively high internal consistency. Reliability is 80% and the same instrument is reliable to use further in the study.

Table 4 KMO & Bartlett's Test

Kaiser-Meyer- Olkin (KMO) measure of sampling adequacy		0.708
Bartlett's test of sphericity	Approx. Chi-Square	5022.22
	Df	253
	Sig	0.00

In the above table, the KMO measure of sampling adequacy is recorded. It is .708, It indicates that Factor Analysis can be useful for the analysis.

Bartlett's test of sphericity was applied to examine the appropriateness of the data for factor analysis. The test value is 5022.22, which is highly significant. Hence, all the measures reveal that the data set is appropriate for applying factor Analysis.

Table 5 Communalities

Sr. No	Reasons that restrict women from investing in the stock Market	Initial	Extraction
1	Lengthy procedure of stock market	1.000	0.608
2	Complex formalities of stock market	1.000	0.811
3	Lack of awareness	1.000	0.760
4	Unpredictability in stock market	1.000	0.705
5	Low Liquidity	1.000	0.781
6	Risk of capital Loss	1.000	0.735
7	Lack of financial resources	1.000	0.816
8	Time constraints	1.000	0.795
9	Brokers don't provide necessary assistance	1.000	0.750
10	Difficulty in consulting with financial Advisor	1.000	0.790
11	Risk averse attitude	1.000	0.770
12	Family Restrictions	1.000	0.830
13	Insufficient technical knowledge	1.000	0.804
14	Inefficient grievance handling system	1.000	0.905
15	Non-availability of reliable information	1.000	0.895
16	Difficult to trust financial advisor	1.000	0.965
17	Decision related dependency on others	1.000	0.825
18	Unsupportive environment	1.000	0.804
19	Religious and cultural issues	1.000	0.740
20	Language barriers	1.000	0.795
21	High brokerage charges	1.000	0.815
22	Delay in transfer of shares	1.000	0.920
23	Low growth	1.000	0.905

Above table reveals Communalities that show the variance of each variable that is contributed to the total variance of factor that restrict women investors to invest in the stock market. The value of all variables is more than 0.50. It lies between 0.608 and 0.965. Therefore, this data can be used for factor analysis.

Table 6 Total Variance Explained

Components	Initial Eigen Values			Extraction sum of Squared Loadings			Rotation sum of squared Loadings		
	Total	Percentage of variance	Cumulative Percentage	Total	Percentage of variance	Cumulative Percentage	Total	Percentage of variance	Cumulative Percentage
1	3.970	22.255	22.255	3.970	22.255	22.255	3.780	21.391	21.391
2	2.874	18.491	40.746	2.874	18.491	40.746	2.614	17.990	39.381
3	2.423	13.535	54.281	2.423	13.535	54.281	2.350	14.201	53.582
4	2.267	10.211	64.492	2.267	10.211	64.492	2.215	11.991	65.573
5	1.564	9.795	74.287	1.564	9.795	74.287	1.518	8.673	74.246
6	1.305	8.585	82.872	1.305	8.585	82.872	1.934	8.638	82.884
7	0.990	3.06	85.932						
8	0.938	2.79	88.722						
9	0.805	2.44	91.162						
10	0.640	2.35	93.512						
11	0.415	1.92	95.432						
12	0.350	0.89	96.322						
13	0.290	0.775	97.097						
14	0.205	0.505	97.602						
15	0.182	0.445	98.047						
16	0.142	0.335	98.382						
17	0.135	0.33	98.712						
18	0.861	0.295	99.007						
19	0.065	0.3	99.307						
20	0.050	0.28	99.587						
21	0.048	0.26	99.847						
22	0.035	0.15	99.997						
23	0.022	0.003	100						

Above table reveals that the total variance explained by each component. Factor analysis analyzed to 23 statements and main Six factors i.e. 82.884 % of the variance. Moreover, factor loadings of 0.50 or higher are considered significant.

The first principal component explains the largest part of the total variance. It accounts 22.255% of the total variance, the second component explains 18.491%of the total variance, the third component reflects 13.535% of the total variance, the fourth component shows 10.211% of the total variance, the fifth component shows 9.795% of the total variance and the sixth component indicates 8.585% of the total variance.

A Component that reveals an Eigen value greater than 1 indicates for a greater amount of variance. Therefore, only those components are taken as principal components which have Eigen value more than 1.

Table 7 Rotated Component Matrix

Components	1	2	3	4	5	6
Language Barriers	0.866					
Insufficient Technical Knowledge	0.764					
Lack of Awareness	0.816					
Lack of Financial Resources	0.876					
Risk averse attitude		0.625				
Difficulty in consulting with financial advisor		.665				
Difficult to trust the financial advisor		0.889				
Time constraints			0.690			
Family restrictions			0.897			
Decision related dependency on others			0.781			
Lengthy procedure of stock market				0.691		
Complex formalities of stock market				0.769		
Unpredictability in stock market				0.730		
Inefficient grievance handling system				0.903		
Unsupportive environment					0.773	
Religious and cultural issues					0.794	
High brokerage charges					0.777	
Non availability of reliable information					0.924	
Low growth						0.920
Low liquidity						0.804
Risk of capital Loss						0.790
Delay in transfer of shares						0.916
Brokers don't provide necessary assistance						0.804

Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalization
Above table indicates the result of related component matrix which explores six factors with highest factor loadings of each variable in each factor. The rotated component matrix reveals factor loadings (correlation) to evaluate which variables load on each factor. The factor loadings show Personal Hindrances as the first factor (with factor loadings 0.866, 0.764, 0.816, 0.876), Attitudinal Problems as second factor(with factor loadings 0.625, 0.665, 0.889), Family Constraints as third factor (with factor loadings: 0.690, 0.897, 0.781), Infrastructural Barriers as fourth factor (with factor loading : 0.691, 0.769, 0.730, 0.903), Socioeconomic Constraints as fifth factor (with factor loadings: 0.773, 0.794, 0.777, 0.924), and operational Barriers as sixth factor (with factor loadings: 0.920, 0.804, 0.790, 0.916, 0.804)

Table 8 Reasons which restrict women from Investing in the Stock Market

Sr. No	Components	Eigen Value	Cronbach's Alpha	Loadings
F1	**Personal Hindrances (22.260%)**	**3.970**	**0.710**	
	Language Barriers			0.866
	Insufficient Technical Knowledge			0.764
	Lack of Awareness			0.816
	Lack of Financial Resources			0.876
F2	**Attitudinal Problem (18.494%)**	**2.874**	**0.704**	
	Risk averse attitude			0.625
	Difficulty in consulting with financial advisor			.665
	Difficult to trust the financial advisor			0.889
F3	**Family Constraints (13.534%)**	**2.423**	**0.699**	
	Time constraints			0.690
	Family restrictions			0.897
	Decision related dependency on others			0.781
F4	**Infrastructural Barriers (10.210%)**	**2.267**	**0.716**	
	Lengthy procedure of stock market			0.691
	Complex formalities of stock market			0.769
	Unpredictability in stock market			0.730
	Inefficient grievance handling system			0.903
F5	**Socioeconomic Constraints (9.798%)**	**1.564**	**0.803**	
	Unsupportive environment			0.773
	Religious and cultural issues			0.794
	High brokerage charges			0.777
	Non availability of reliable information			0.924
F6	**Operational Barriers (8.587%)**	**1.308**	**0.799**	
	Low growth			0.920
	Low liquidity			0.804
	Risk of capital Loss			0.790

Above table shows that factors' assessment summary to give clarity to the factors extracted. Subjecting the data to factor analysis, it is reduced 23 statements to six factors. These factors are:

F1 - Personal Hindrances: Table 7 shows that Personal Hindrances is the first and the most significant factor comprising of four statements. It explains 22.260% of the total variance of the data with an Eigen value of 3.970. The factor encompasses four statements namely, "language barriers (.866)" "Insufficient technical knowledge (.764)," "Lack of awareness (.816)," and "Lack of financial resources (.876)". The statements cover the personal weaknesses that women felt within themselves which restricted them from investing in the stock market. It is mainly due to lack of awareness that women are not able to invest in the stock market. Moreover, language barriers and insufficient technical knowledge also play a significant role as personal barriers which prevent women from investing in the stock market.

F2 – Attitudinal Problems: The second component, Attitudinal Problems, explains 18.495% of the total variance with an Eigen value of 2.874. It covers three statements namely, "Risk averse attitude (.625)," "Difficulty in consulting with advisor (.665)," and "Difficult to trust the financial advisor (.889)." The statements contained in the factor are related to the attitude of women. It is notable that negative attitude of women prevents them from investing in the stock market.

F3 – Family Constraints: The third dimension, Family Constraints, accounts for 13.534% of the total variance with an Eigen value of 2.423. It consists of three items such as "time constraints (.690)," "family restrictions (.897)," and "decision related dependency on others (.781)". The statements contained in the factor are related to family obligations which restrict women from undertaking the task of investment in the stock market. It is mainly due to time constraints and with respect to decision making that women are dependent on family members.

F4 – Infrastructural Barriers: The fourth dimension, Infrastructural Barriers, is a combination of four statements. The statements included in this factor are "Lengthy procedure of stock market (.691)," "Complex formalities of stock market (.769)," "Unpredictability in stock market (.730)", and "Inefficient grievance handling system (.903)". This factor explains 10.210% of the total variance with Eigen value of 2.267. These statements cover the internal constraints of the stock market such as cumbersome procedure of the stock market restricting women from investing in the stock market.

F5 – Socioeconomic Constraints: The fifth factor, Socioeconomic Constraints, accounts for 9.798% of the total variance explained, with an Eigen value of 1.564. It includes four items such as "Unsupportive environment (.773)," "Religious and Cultural issues (.794)," "High brokerage charges (.777)," and "Non availability of reliable information (.924)". The statements contained in the factor are related to social and economic environment which restrict women to undertake the decision of investment. This factor brings out the fact that although women are increasingly participating in making investments, but still, the social set up is such that women find it difficult to take fully independent investment decisions.

F6 - Operational Barriers: The sixth dimension, Operational Barriers, accounts for 8.587% of the total variance and has an Eigen value of 1.308. The factor comprises of five items namely, "Low growth (.920)," "Low liquidity (.804), "Risk of capital loss (.790)," "Delay in transfer of shares (.916)," and "Brokers don't provide necessary assistance (.804)." These statements cover the factors related to the performance of stocks which are very important for women investors to consider while investing in the stock market. In this way, negative performance of a stock like generating loss, low growth, and low liquidity would restrict women from investing in the stock market.

Recommendations:

The present study recommends that financial institutions and companies must develop a revised framework which avoids lengthy procedure and complex formalities of the stock market. The grievance handling system need to be strengthened that can encourage women to go for investing in the stock market. To avoid the unpredictability of the stock market, a proper mechanism should be in place to maintain the trust of the investors during fluctuations of the stock market. Moreover, government and financial regulators should come forward to fortify the regulations and design such policies that can foster the confidence of women and make them comfortable for investing in the stock market. In this regard, financial institutions and companies should organize campaigns and workshops to make women more aware and technically sound with various dimensions of investment.

Research Implications:

The findings of the study will help the financial advisors and planners in formulating suitable investment strategies for the investors because a thoughtful decision for investment in the stock market is desirable for economic development. It is hoped that the findings will assist financial advisors, investment managers, and financial consultants to understand and discover the solutions to those factors which cause variations in investment decisions. For giving proper and accurate financial advice, it is necessary to identify the factors that affect the investment decisions of a person appropriately. This study corroborates the importance of financial literacy to make women more aware and technically strong with dimensions of investment. Further, it will help in making an ideal investment portfolio by accommodating the needs of investors effectively. Thus, this study will contribute to the understanding of investment behavior of investors.

Conclusion:

Conclusively, it can be articulated that there are numerous problems which restrict women from investing in the stock market. It is observed that women are highly dominated by social norms and cultural values. Besides this, certain family restrictions, personal hindrances, as well as attitudinal barriers prevent them from entering professions that are supposed to be dominated by men. The barriers which restrict women from taking up the decision of investment I the stock market are related to operational performance of stocks in which they invest such as low growth, associated risks, and low liquidity. Apart from that, brokers don't provide necessary assistance and there are high brokerage charges, which act as obstacles in the way of women to invest in the stock market.

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CORPORATE COMMUNICATION: BEST PRACTICES ADOPTED BY IT COMPANIES TO ENHANCE EMPLOYEE ENGAGEMENT

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ABSTRACT
In recent years, the term "employee engagement" has gained popularity among human resource (HR) professionals all across the world. Every employer nowadays wants to get the most out of its staff. Without communication, there can be no interchange of ground-breaking ideas, robust interpersonal relationships, or genuine job motivation. Effective communication may boost workplace efficiency, customer satisfaction, and company expansion. IT industry has now expanded to embrace almost all aspects of computing and technology despite its ups and downs, the IT industry continues to be one of the most important contributors to the country's economic growth.
Purpose: This study's goal is to assess and comprehend the tactics employed by IT companies to enhance staff management, with a particular emphasis on internal communication.
Methodology: In order to lay the groundwork for a literature review, this explore uses a supervised approach to review secondary data from reliable data sources, including research papers from Science Direct, Elsevier, Sage publications, and other sources.
Result and findings: Corporate communication is essential for fostering employee engagement in the Information Technology (IT) industry. The findings show that highly engaged workers are healthier, happier, more loyal, and more productive. They also have greater retention rates.
Implications: This study will be utilized by numerous IT and other industries to develop strategies for forthcoming employee engagement founded on communication.
Keywords: Corporate communication, Information Technology (IT), Human Resource (HR), Employee engagement

Introduction:
Employee engagement is actually a word used extensively in the consulting industry, but nowadays in academics it is use for research purposes. Many individuals believe that being committed or retained by an organization is depend on a condition of mind or behavior. It is used to monitor or control employees' actions and cognitive processes, which is very helpful for every organization to create a positive work environment. An organization can tell whether an employee is genuinely committed to their work or just trying to put in the time. Improving employee engagement practices is significant to a company's success. Disengaged and unsatisfied employees are less effective at their jobs and offer poor customer service. (Mohamad S. Hammoud & Schrita Osborne, 2017) Employee engagement will increase if an organisation appreciates cooperation, regards workers as partners, trusts them, respects them, and views them as innovative and enterprising individuals while encouraging their readiness to take initiative, make ethical judgments, and assume responsibility.. (Małgorzata Baran and Barbara Sypniewska, 2020) "As per the result of the study by Binita Tiwari & Usha Lenka, (2020) resonant leadership has a non-significant relationship with employee engagement. Employee engagement levels have grown, though, as a result of increased internal corporate communication, sharing of information, continual learning, entrepreneurial orientation, and perceived job satisfaction and organizational commitment. High employee engagement helps in developing the organisation's image as an employer brand."

Statement of Problem:
One of the industries with the fastest growth in India is IT. It is imperative to look into employee engagement approaches and the role that corporate communication plays in this.
Objectives:
1. To understand the importance of employee engagement in the IT sector.
2. To examine how important corporate communication is in boosting employee engagement in the IT business.
Scope:
The study's analysis is solely limited to employee engagement strategies. This study primarily focuses on the Indian IT industry, one of the country's fastest-growing sectors.

Literature Review:
Employees who are "engaged" are passionate about the company's goals and ideals, as well as being intellectually and emotionally attached to it (Binita Tiwari & Usha Lenka, 2020). Employee engagement is the term used to describe an individual's emotional dedication to their work, their organisation, its goals, and its business practises. (Gauravkumar Mahipatbhai Patel, 2010) It strengthened if there was a high level of trust within the company, open communication between managers and staff, clear explanation of the organization's objectives, and strong motivation. Regardless of the size of your firm, it will immediately increase output and profitability. (2015) Reetika Sharma. Business leaders in communication may be able to improve corporate procedures while also bringing about positive societal change (Schrita Osborne & Mohamad S. Hammoud, 2017).

By concentrating on possibilities, improving organizational decision-making, and boosting commitment, organisations can increase employee engagement (Chandani, Arti & Mehta, Mita & Mall, Akanksha & Khokhar, Vashwee, 2016). According to the proposed employee engagement model, communication, confidence, pacification, cultivation, and compensation are elements that promote organisational health and welfare in the existing emergency, and indicators are provided to measure each single's success (De-la-Calle-Durán, M.-C., & Rodrguez-Sánchez, J.-L., 2021).

Practices Adopted by IT Companies:
"In its tough orderly process, the Indian IT sector is concentrating on unique engagement tactics underpinned by the values of communication, appreciation, incentives, recognition, and care. The workplace has changed in the modern era into a "nurturing hub" where employees' personal and professional objectives are urgently attended to, recognising the crucial role played by employee involvement in improving the overall success of the firm. Chandni M. C. and Dr. Manjunath S., 2018) Reetika Sharma, a researcher, claims that while different companies may apply similar techniques, the measurement tools would vary depending on the personalities and work styles of the personnel. The procedures used by IT organisations are simply explained:

- **Clarity regarding the company's principles, rules, and practises:**
  By becoming involved in the company's vision, its products, and its future direction when company communicate important information with them, their employees can become brand ambassadors for their firm. Khaner Walker, Aneil Mishra, and Karen Mishra, 2019. These approaches include intrapreneurship, reverberating leadership, internal corporate communication, information sharing, constant learning, and apparent communication satisfaction. By communicating about shifting business goals in a clear and consistent manner through the proper channels, managers may enhance employee trust. (Binita Tiwari & Usha Lenka, 2020)

- **Pay and Perks:**
  To entice individuals to work for a company, it must have a strong compensation structure. Workers must receive specific compensation and benefits in order to increase their level of involvement. Employees believe that rewards should be genuine and performance and that recognitions should be provided soon away. (Gauravkumar Mahipatbhai Patel, 2020).

- **Assessment:**
  A fair evaluation of the employee's performance is a crucial element in deciding the amount of involvement. Companies that implement a proper assessment procedure that is perceived as impartial and transparent have higher employee engagement.

- **Communication:**
  Communication has a key role in determining worker or staff's satisfaction and engagement. "Organizations must make an effort to inform all employees as to what is happening in the organization and engage their employees through more periodic communications on organization's progress towards its business goals." (Gauravkumar Mahipatbhai Patel, 2020). Here are a few tools that fully motivated companies use::
  - At a time conferences with a single individual
  - Group consultations with the whole organisation
  - Emails since leadership team or department meetings
  - Interviews or meetings at the time of end of a project
  - Employee gratification reviews
  - Conversations or performance reviews
  - Social media
 - Roundtable talks on administration
  - Formal targets

Clear instructions on job duties and responsibilities, reporting relationships, and authority all contribute to the psychological contract. When employees believe that the communication process is fair, their uncertainty decreases, their involvement improves, and they are more willing to exert extra effort. Both the message being transmitted and the manner in which it is being communicated must be taken into account. When it comes to corporate communication, this is especially true. Company culture may offer a substantial strategic advantage in these dynamic times. However, for employees to understand and adhere to cultural goals, attitudes, and practices, best practices must be used to effectively communicate them. (2021; Jessica Ellspermann the advantages of Amdocs cloud storage, which were developed to communicate with employees and raise employee engagement, were covered by Michael Isaacs (2020) in her blog.

- **Healthy and Secured Environment:**
  Employees only go above and above when they are treated with respect, feel valued, work in a happy, fierce competition, and are given challenging offshore duties based on their training and expertise. (2016) Venugopal Gandasala and Swetha Reddy It was discovered that levels of participation were associated to feeling secure at work. All businesses must therefore implement the proper processes and practises to ensure the health and safety of their workforce. Working hours and health and safety have both been found to influence employee participation in the public sector.

The majority of Indian organizations have used the notion at a behavioral level, thereby merely encouraging employee engagement by forcing the employees to participate in particular activities, according to writers Srivastava, Akancha, Ramachandran, Kumarasamy, and Arumugam, Suresh. (2014) According to the study Gantasala, Venugopal & Reddy, Swetha (2016), organizational support, fundamental backing, cohesive organizational culture, distributive impartiality, cleanliness elements, operative goal settings, evenhandedness, assessment transparency, customized training and coherence are contributing factors that affect employee engagement in IT industries.

Fig. 1 Infosys Stakeholder Engagement *(Source: Infosys Annual Report 2015-16)*
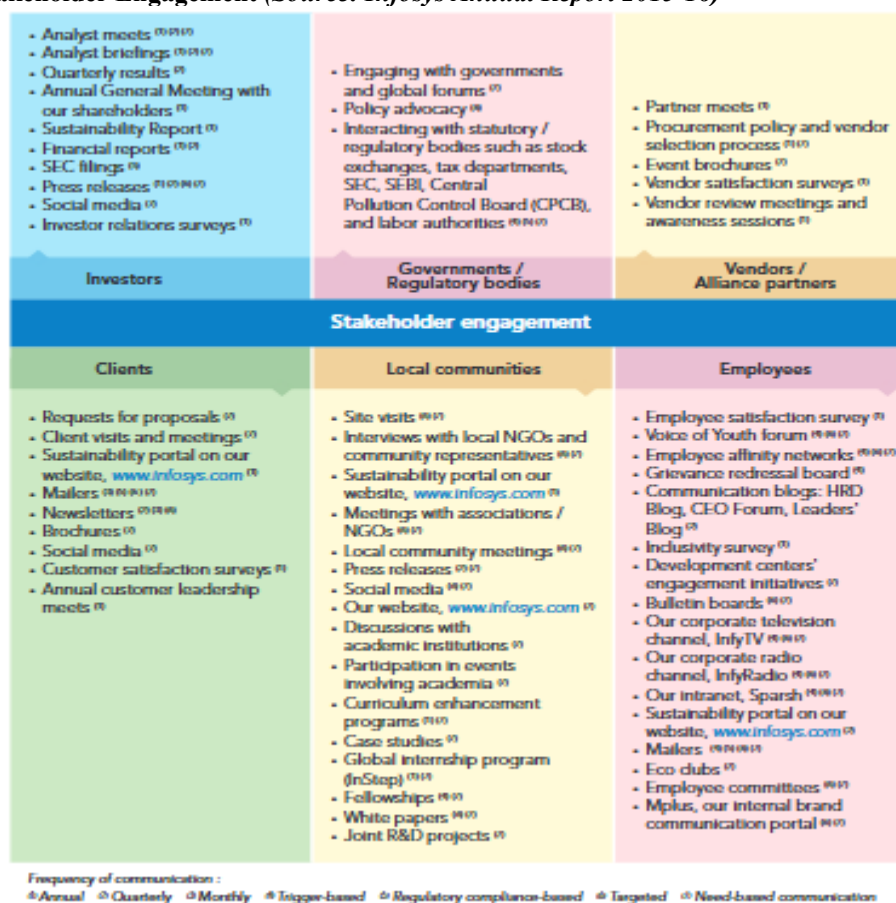
Employees are included as stakeholders in Infosys' 2016 annual report, and defined communication channels guarantee targeted participation all year long. In the fig. 1, they described their stakeholder involvement strategies. According to the study, their yearly employee satisfaction survey, called LITMUS, is still utilized to solicit

feedback from staff. The results of their survey are analyzed, and recommendations for bettering employee engagement are made. They communicate internally using Mplus portal. (Pages 15–16 of Infosys Annual Report).

"Incremental model, evaluate, improve - keep your staff engaged and part of the transformation - communication is vital to generating and effectively implementing change," assert Infosys employees Emmanuelle Blons & Emilie Labidoire (2019). In their study, they also cover how AI will play a big role in enhancing the employee communication between Human resource team members and the workplace. The open communication culture at Google encourages staff members to experiment and question the status quo (Karen, 2017).

Employee Engagement Practices during COVID:
Conventional workplaces and jobs have changed significantly over the past ten years as a result of an increasingly diverse and global workforce, the impact of millennials and digital technologies, and the show economy that is driven by facts Figures, and high-speed connections. Traditional employee workplace norms, engagement goals, and strategies must adjust to keep up with this development. According to the International Labor Organization (ILO), four out of every five workers globally have been affected by epidemic extenuation dealings like lockdowns and work from home orders (2020). Businesses must devise fresh, improved methods of reaching their staff in the midst of this chaos. Various tasks could be reorganized into fresh roles for increased effectiveness.

The current pandemic issue has made it challenging for firms to manage their human resources. Significant changes are being made to the social and work environments, such as the installation of new work rules and measures to bound interaction and the shift to remote work. With the purpose of accomplish employee engagement, organizations are concentrating on providing remote working circumstances that allow staffs to combine work and personal life in this novel environment. Many businesses are now creating a wide range of employee retention and engagement strategies, including such simulated staff meetings, digital training and development, once a week orientation online interactive sessions, web conferencing with industry professionals, stress management and anxiety management online workshops, online team building exercises, online family engagement practices, strategizing, expression of regret, and admiration sessions, TED Talks, e - books, online programs, live group meetings for additional training, digital communication exercises, etc. (Nisha Chanana and Sangeeta, 2020)

The present pandemic situation has made it difficult for businesses to manage their resources, particularly their human resources. The social and working environments are changing significantly, including the execution of new office guidelines and procedures to reduce communication and the shift to remote work. Organizations are focusing on offering remote working options that let employees balance work and personal life in this new setting in order to increase employee engagement. The planning and implementation of a recompence strategy that retorts to the new work situation, including financial expenses as well as non-monetary reimbursements that are more commercially worthwhile due to the firm's economic conditions as a outcome of the epidemic, should be recognized by managers as a good way to enhance employee morale. (De-la -Calle-Durán, M.-C., & Rodríguez-Sánchez, J.-L., 2021)

The School of Work Innovation and partners organized a meeting with selected new business start-ups and scaleups to find innovative methods to engage employees at work. Five participating corporates (Accenture, booking.com, Enexis, EY, and PwC) were present. (The 2019 method for increasing employee engagement among Millennials and Generation Z.)

Importance of Corporate Communication in Employee Engagement:
 "It was discovered that employee engagement was higher when they understood the strategies, initiatives, and processes in place for pay. Good communication between the company and employees, and also between coworkers, is the first step toward long-term involvement. (Chandani, Arti, Mita Mehta, Akanksha Mall, and Vashwee Khokhar, 2016) The focus of HR and management operations typically centers on employee engagement, giving rise to a plethora of surveys, meetings, reward programmers, and other creative programmers. But starting with regular contact is the simplest way to increase participation. This epidemic situation also demonstrates how important it is to build a solid communication path to offer employees stability and security when they most need it. A single, digital center holds staff members conversant and on the same page when teams work across time differences, schedules, or geographies, establishing connections that cut beyond space and time.

Efforts made by the corporation to build employee trust may be advantageous to both the company and the workforce. Employees are more motivated, trust their managers, and feel more empowered to develop relationships with customers on the company's behalf. Employee engagement can be raised by more efficient corporate communication. By analyzing and developing goals for corporate communication, organizations can improve employee morale, overcome departmental obstacles, publicize employee events, inform staff about benefits, and

foster trust. Here are some ideas for enhancing communication abilities, including taking the audience into account, selecting the appropriate intermediate of communication, creating employee resource groups, and using social media to communicate with staff members.

Communications have a big impact on employee engagement. When employees are informed of the most recent corporate news and connected to the other members of the team, they experience less annoyance and exclusion. When individuals are enabled to take an active role in organizational communication, whether through two-way dialogues or content development, they feel valued, supported, and empowered.

Findings and Discussions:
1. By placing assets into employee engagement, the company will be able to boost efficiency, quality of work, and retain the best talent.
2. Highly engaged staff have superior performance, greater retention rates, and higher levels of happiness and loyalty.
3. Engaged staff members perform better, which enhances the quality of services provided to customers and clients.
4. IT businesses have used new and conventional strategies to increase employee engagement.
5. One of the finest strategies for boosting employee engagement is communication.
6. Good communication may increase workplace efficiency, employee engagement, and business growth.
7. COVID stressed that communication is crucial for fostering employee engagement.

Conclusion:
The principal goal of this research was to discover the employee engagement methods employed in IT companies and to establish a relationship between the strategies' emphasis and the various employee engagement measures. The study found that almost all IT organizations had implemented employee engagement strategies for their staff during the examination. These companies seem to have recognized the significance of the idea of "engagement," not just for achieving their ultimate goals but also for existing in a competitive market.

A examination of the literature indicates that although IT organizations use a variety of employee engagement strategies, communication stands out as the best approach. Everyone wants to feel relevant, so when employees feel their opinions matter, they are more likely to engage in the culture in a positive way. When a company implements effective corporate communication strategies, employees feel more at home and inspired. Engaged workers are more dedicated to their tasks. Make better utilization of the internal communications system as a result and leverage the creation of microlearning content to expand it quickly and effectively. It will spur employees to consistently put in more effort to get results that benefit the bottom line.

Scope for further Research:
To find out more about the variables affecting employee engagement, a comparison study or a study with a specific IT company may be done. The research could be repeated in various industries, such as tourism, construction, retail, and education, to learn about the methods used for employee engagement in those fields. It is also possible to undertake empirical research on employee engagement strategies and the effects of corporate communication.

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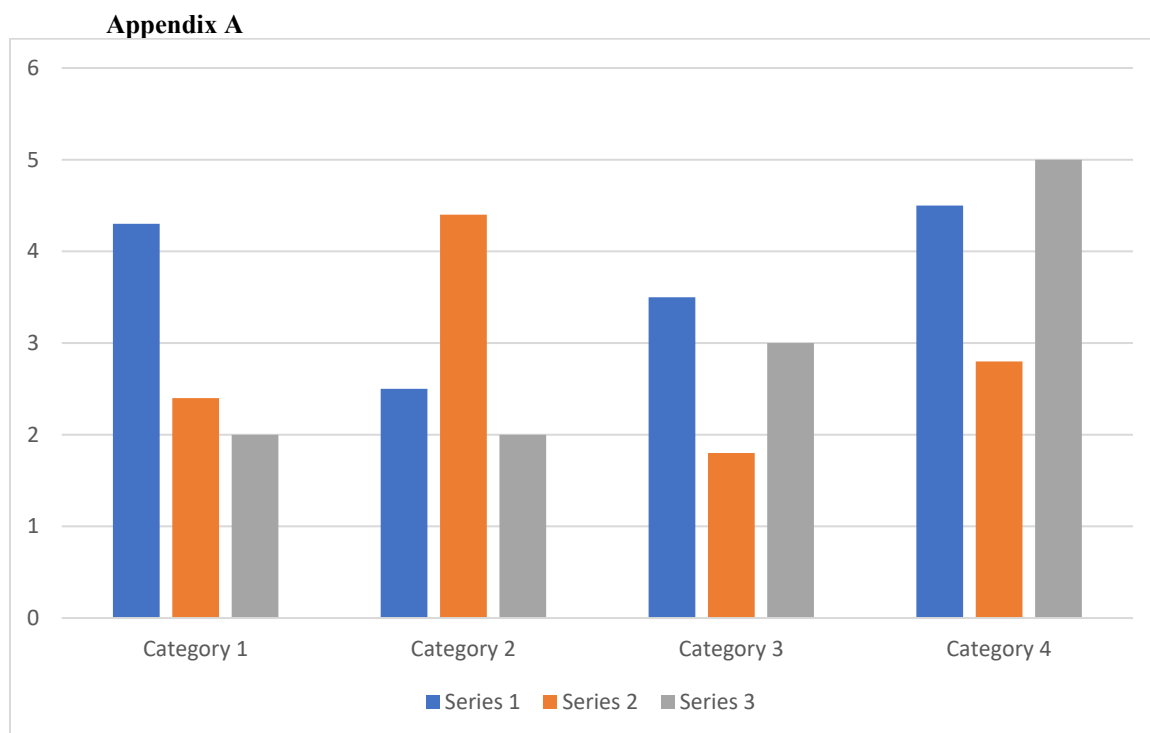
Appendix A
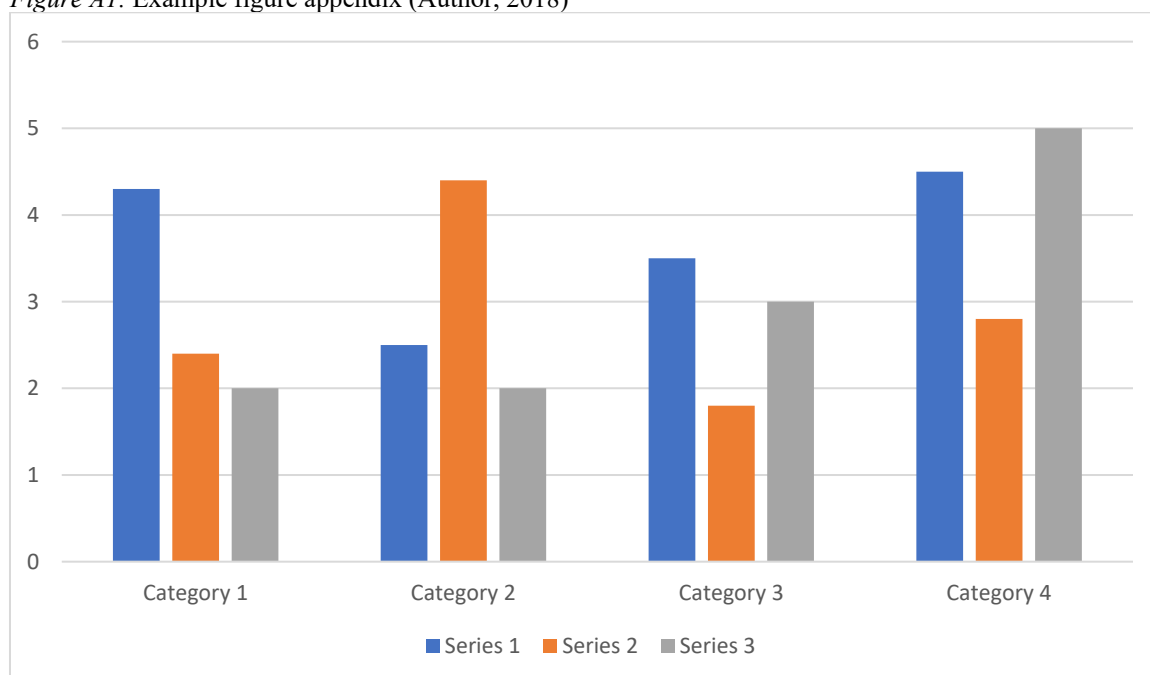

Figure A1. Example figure appendix (Author, 2018)

Figure A2. Example figure appendix (Author, 2018*)*
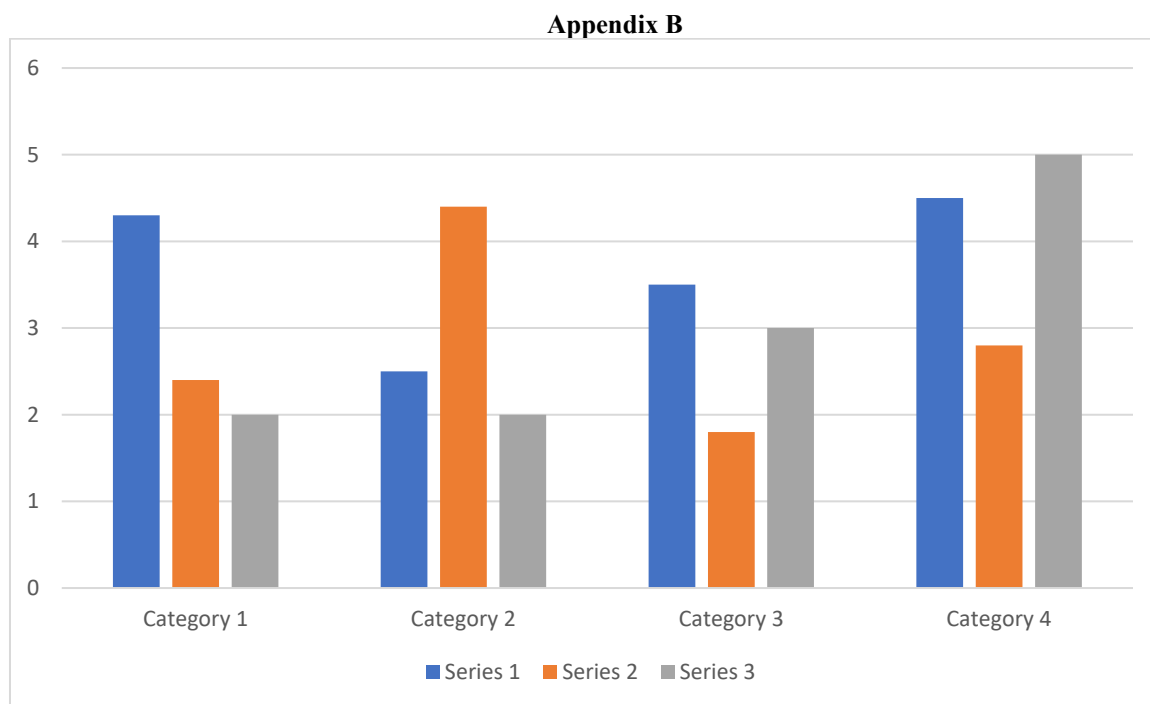
Appendix B

Figure B1. Example figure appendix (Author, 2018)

IMPACT OF DIGITAL BANKING ON RETAIL BANKING PRODUCTS WITH REFERENCE TO PUBLIC SECTOR BANKS IN INDIA

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ABSTRACT
With the advent of new goods, operations, and marketing strategies, digitalisation is fundamentally changing the financial sector. Since it will require some time for this transition to be fully realised, banks must move quickly and adopt the latest technology in order to have a viable model of operation. Almost each economic potential is evolving as individuals use modern technology to a greater extent. The digital advances are dynamically changing acquisition and interaction, screening as well as financial assessment, invoicing and compensation. The fresh wave is fuelled by development, and among the greatest obstacles that happens in the future is the financial sector's technological evolution. This presents a significant chance for these sectors to reinvent itself. A key factor in every company system, conventional or virtual, is client satisfaction. Consumers' pleasure is essential for developing lengthy network connections, thus businesses in uncertain economic environments need to learn how to meet the needs of users in order to safeguard market share and expansion. The truth that assessment methods has grown commonplace in several banking institutions during the past six years is proof of this. Therefore, it is crucial for company to have a foundational grasp of the variables affecting consumer happiness. The difficulties in the financial institution is having a raising customer engagement while promoting its virtual financing options are the main topic of this article.
Keywords: Marketing Strategies, Digitalisation, Financial Sector, Technology, Evolution & Financial Assessment

INTRODUCTION
From conventional banking systems to the modern electronic banking era of the internet, the path of Indian banking transfer as well as settling processes has experienced dramatic development. Also with emergence of new innovation offerings and services by bankers, users' needs for bank services continue to evolve. Public sector banks took a while to adapt to the shifting needs and demands of its customers for financial services.

Latest generation privately held banks with a traditional banking system were introduced in 1995, changing the banking sector's sales and promotion tactics. To deliver more practical, fast, secure, as well as secure services, they pioneered the idea of banks coming to the client. The initial step in contacting clients at their homes and places of employment to fully learn about their requirements was door-to-door financing. Then, in response to those necessities, online banking merchandise such as Digital banking, m - banking, RTGS, IMPS, UPI, credit card, debit card, ATM, etc. were introduced.

As the nation's central bank, the Indian Government's Reserve Bank has only ever placed a priority on banking and financial services that don't require checks or currency. The conceptual transition toward innovation banking systems that bank clients and bankers underwent was significantly influenced by RBI. In addition, RBI made sure that the firm maintained accessible, legal, and professional procedures to provide wonderful and practical services to its clients.

OBJECTIVE OF THE RESEARCH
This study article's primary goal is to:
1. To research the different difficulties that banks and other financial organizations have while promoting their goods online.
2. Understanding client's gratification levels and the specific charities of the rise in financial unhappy clients is the major priority.

LITERATURE REVIEW:
M.S. Balaji, et. al., in the research "Measuring effectiveness of customer relationship management in Indian retail banks", International Journal of Bank Marketing, Vol. 30 Iss: 4, pp.246 – 266" determined that the study develops a cross evaluation to assess the efficiency of client affiliation administration in our banking industry. Consider the connection between the sample's development and validation and the primary consumer dependent variables. Users

of our retail banks were asked to reply to questionnaires in this research in order to discover important client affiliation administration features. 259 active account holders who frequently do operations were used as a sample size to test the reliability coefficient of the client affiliation administration scale. The gathered information was evaluated to understand the link amongst client affiliation administration characteristics and users'behavioural consequences, including cross-selling, retention, and customer loyalty. The determination of the aspect will assist branch managers in putting in place an efficient client affiliation administration that increases consumer loyalty while providing banks the chance to pass their clients on important additional and irrelevant items.

R.D. Sharma et al., in the study "Exploring customer switching intentions through relationship marketing paradigm", "International Journal of Bank Marketing, Vol. 30 Iss: 4, pp.280 – 302" revealed that the research examines the magnitude of consumer shifting and the numerous factors that influence clients' inclinations to change. There are several reasons or circumstances that influence a client's intention to switch banks or not. The greatest aspect that affects a client's choice to switch accounts is contentment, that has evolved as among the most crucial considerations when selecting a new financial institution in the hope that his demands would be met.

Shailendra Singh Bisht et. al., in the study "The impact of trust and perceived risk on internet banking adoption in India: An extension of technology acceptance model", International Journal of Bank Marketing, Vol. 30 Iss: 4, pp.303–322" The researchers have taken into account a number of factors that limit the usage of online banking within "potential benefit," and they also take into account the importance of the payment page as a significant instrument for determining potential risk. The bank's website should really be open and honest about the characteristics of its offerings, entry requirements, bond yields, and fee structure.

"Live Mint – 28th October, 2016 – The Cost of Mis-Selling Financial Products" explored that the findings unambiguously show that banking are motivated by their inner perverse incentives and aren't especially worried with the demands of their clients. The study and analysis note that financial sector banks' promotional activities are centred on increased incentives or commissions, particularly when it comes to 3rd party services. Even though Private Sector Banks' flexible remuneration is correlated to their yearly review and advancement. At contrast, advancements in Public Banks are partially based on the mobilisation of CASA AND Bank Deposits deposits. 98% of bank executives refuse to record accurate profits for financial products, according to the survey. Unaligned opportunity behaviours were a major contributor to the global financial meltdown of 2008. Inappropriate variable annuity promotion may have a negative effect on a person's faith in the banking system, result in lost opportunities or genuine liabilities, and damage the institution's image.

As per "The Economic Times dated 29th August, 2016" explored that RBI should watch out for banks mis-selling health coverage goods - For the year, the Indian Reserve Bank intends to increase its attention on preventing the improper of financial products. "We will therefore assess the performance of bankers and determine whether additional restrictions are required to ensure consumer safety." The most recent financial report for FY'16 included a foreword by RBI governor RaghuramRajan. "For the year, we will definitely pay attention to the problem of improper, notably of healthcare policies. In order to better enlighten the general population about how to avail benefit of financial possibilities and safeguard themselves, we would also concentrate on improving our contact among consumers."

According to Monika Halan, et. al., "Milsead and Misold" determined that monetary misconduct at retail banks: The auditing technique was adopted, and reviewers requested revenue device flyers and other records from banks that were utilised when clients were informed about the programme. Strong sales motivations in private banking firms lead to recommendations for the higher cap offering. When it comes to initiatives to mobilise deposits, public sector banks advise their clients to make term deposits. Banks seldom ever voluntarily disclose the details of their products. It was noted that the consumers' documentation is lacking and does not fully disclose all of the characteristics of the plan. Our findings highlight the difficulties in requiring declarations when consumers are unaware of the importance of a product and its benefits and dealers are either unaware or in the effect of rewards.

In a study by Vikas Gautam (2012) investigates the effect of virtual-banking on the revenue, effectiveness, and level of customer service provided by 15 Indian banks. Electronic-banking has been proven to significantly increase revenue while reducing expenses. Pooja Malhotra and Balwinder Singh's study from 2007 aims to examine the variables influencing 87 banks in India's introduction of electronic banking from 1999 to 2006. The results showed that generation and customer base had a significant detrimental effect on the chance of online banking uptake, but volume, investment, and expenditure proportion all impacted this probability. Private banks have discovered that using online banking features to grow existing network of branches has been less successful overall.

The adoption of internet banking has increased banks performance while cutting down on operating costs. Due to various digital communication, lesser workers are needed to provide operations; the reliability of activities and administration has also increased as systems have replaced people, decreasing potential mistakes; operations, methods, and facilities are now quick and dependable, helps to save time, energy, and cash. (Sumra (2011).

According to experimental observations, Kanika (2017)'s analysed about the influence of internet banking elements on capital structure found that it is significant in public banks but little in private and foreign banks. The results also showed that the efficiency of banks was not significantly impacted by internet banking. Meihami et al. (2013) claimed that by using a variety of IT resources, we may decrease the volume of monetary operations. This finding is supported by studies on the use of IT in banking. By using online banking rather than the conventional banking system, we might just save cost. IT use in banking lowers threat, boosts reliability, and makes life easier. According to Siddik et al. (2016), internet banking has a positive impact on bank efficiency in Bangladesh as measured by ROE.

Bankers Fundamental Change Circumstance: Views from the Customers, Bankers, and Regulators[3]
Client`s Interpretation:
All consumers are appreciative of the interpret in the consumer banking services provided by banks and credit unions to their clients. Clients now have a variety of distribution channels options for conducting individual banking activities, including ATMs, contactless payments, bank cards, online banking, m - banking, and numerous electronic payment mechanisms including NEFT, RTGS, and IMPS. When choosing to use digital payments, clients often choose simplicity, money and time benefits, safety, highly customized services, priority banking, bank transfer, and quickness. Cybersecurity scams and lenders' misrepresenting the truth while selling CASA and 3rd party products are two significant obstacles to the expansion of online payments. According to a 2013 Capgemini Survey Conducted on Conventional Banks, global utilisation of m-banking will surpass 63% in 2016 while that of online payments will surpass 93%. [4]

Investment banker`s Interpretation:
Banks are actively exploring latest technological channels including mobile distant recording and advertising of electronic banking services in response to altering client requirements. Linkedin, Insta, Facebook pages, and Youtube have all emerged as popular platforms for promoting bank products to clients. Banks are currently modernising its physical branch network branches to focus mostly on advertising, revenue, and banking and finance consulting while centralising necessary activities. The banks have implemented a number of technological innovations in the transaction system in the hopes of delivering effective services to its clients and fulfilment.

Supervisory body`s Interpretation:
The Indian Reserve Bank made the decision to form a taskforce under the Monitoring Costs and Growth Commission Standing Advisory board in April 2016 to examine the specific applications and ramifications of financial technology. This organization's primary goal is to assess the legislative regime, refocus it, and adapt to the realities of the quickly changing Fin Tech electronic banking environment.

RESEARCH METHODOLOGY / DESIGN:
In accordance with demographic factors including Category, Age (years), Academic Accomplishment, Career, a sample size of 100 Delhi NCR residents with bank accounts holders was arbitrarily picked. [5]. The statistical method of the dependent profile is shown in TABLE 'A'.

Table 'A' - Rate of Recurrence Exploration of Statistical Characteristics of Human Populations Parameters

Location State/UT-Delhi			
Ser No	**Parameters**	**Classification**	**Rate of Recurrence**
1.	Category	Male	73
		Female	27
		Total	100
2.	Age (years)	18-25	28
		26-35	27
		36-45	13
		45-60	23
		60 & above	9
		Total	100

3.	Academic Accomplishment	Senior Secondary	8
		Graduate	56
		Post Graduate	23
		PhD	7
		Others	6
		Total	100
4.	Career	Business	28
		Employee	37
		Professional	8
		Student	21
		Others	6
		Total	100

(Source: Primary data was collected from Delhi NCR region with 200 Customers having bank accounts during 2015-16 financial year.)
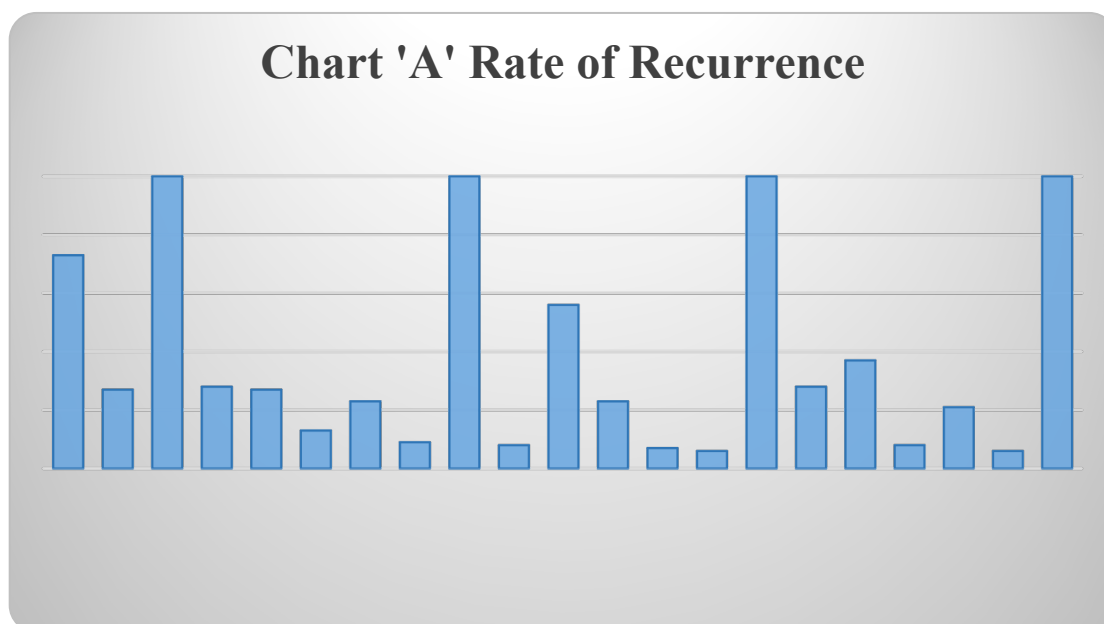

Chart 'A' Rate of Recurrence

Table 'B' demonstrates that the 05 banks chosen for the research from the 3 types of banks represent the fact that financial companies have varying levels of technological sophistication. Since 2012–2013, latest generation private sector banks have had more advanced online banking systems, but PSB and older private sector banks are currently trying to keep up.

Table 'B' : Survey Questionnaire

| Ser No	Public Sector Banks
1.	State Bank of India
2.	Punjab National Bank
3.	Oriental Bank of Commerce
4.	Bank of Baroda
5.	Canara Bank
Source: Principal Data	

Table "C": The following list of characteristics served as the basis for designing the survey questions: Table 'C' Numerous Criterion - Assessment Feedback form

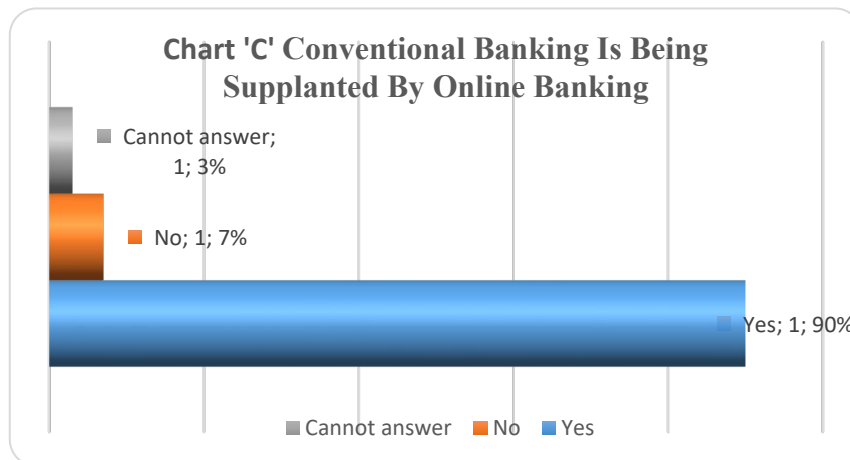| Ser No	Clients Perspective	Bankers Perspective
1.	Faith	the distribution of current digital goods
2.	Consistency	Bank marketing communications procedure
3.	Approachability	variables influencing consumer adoption of electronic financial services
4.	Exactness	Reception proportion level of electronic banking products
5.	Receptiveness	Favored method of internet banking by clients
6.	Rapid Determination of enquiry	Level of clients fulfilment
7.	Internet site Strategy	Utilization of digital banking products
8.	Consciousness of Bank Merchandises	Falsification of a merchandise or facility's appropriateness undesirable observation
9.	Affiliation Executive Backing	Reasonable regulations against exaggerating the acceptability of an item or service
10.	Continual Provisions	Promotional and operational reporting requirements

**Data Analysis and interpretation:**
Table 'D' Clients Analysis Retort

| Clients Analysis Retort		Certainly	Certainly not	Incomplete	Cannot predict
1.	Conventional banking is being supplanted by online banking	90	7	0	3
2.	The bank offers all online banking options	95	5	-	-
3.	Users get upset whenever a bank representative calls.	72	19	5	4
4.	Does missed sales have a detrimental impact on how users view the adoption of and use of online banking products?	100	-	-	-
5.	Did you set up a never call list for their contact phone?	52	48	-	-
6.	Banking promotions and regulation are at odds with one another	62	28	6	4

Chart 'B' Clients Analysis Retort
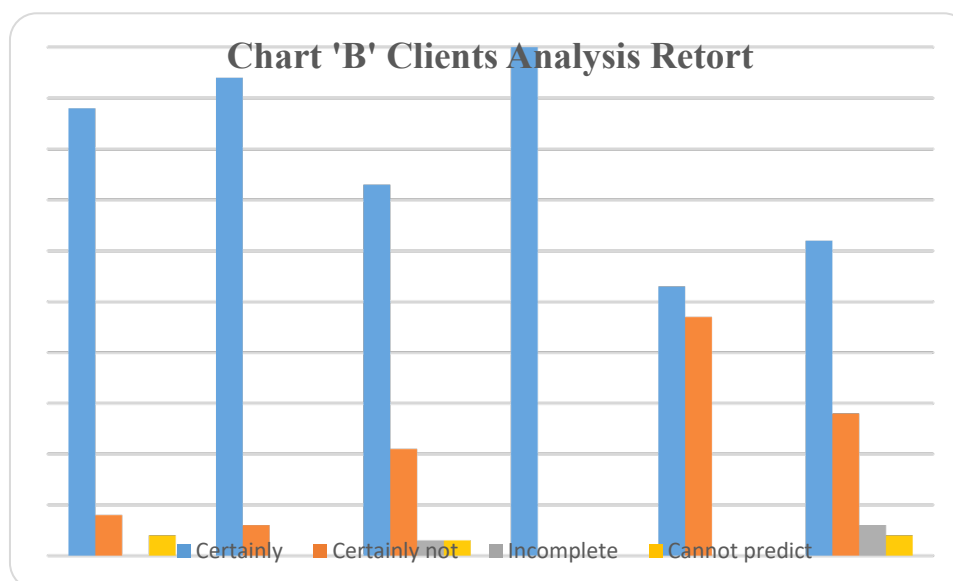
According to Chart C, 90% of respondents concur that conventional methods involving branches visiting and decentralised operation financial systems are being replaced by electronic financial services including ATM, credit/debit cards, online banking, m - banking, and electronic fund transfer. While 7% of users, mostly older individuals, claimed they favored utilizing ATM debit cards instead of internet transactions, 3% of consumers reported being unable to provide comments.

Chart 'C' Conventional Banking Is Being Supplanted By Online Banking

- Cannot answer; 1; 3%
- No; 1; 7%
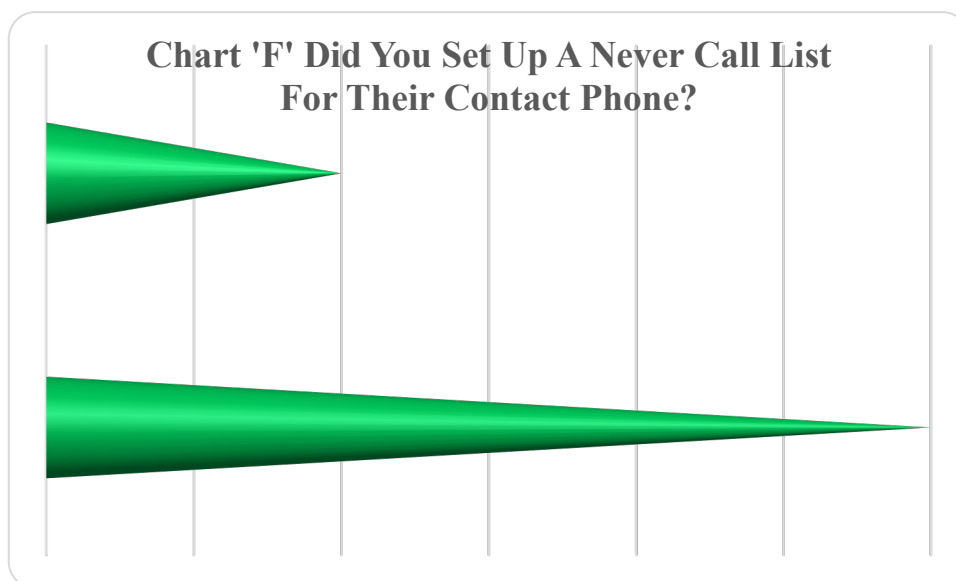- Yes; 1; 90%

Cannot answer ■ No ■ Yes

95 percent of banks in Chart "D" that offer electronic banking services and 5 percent of banks that have RTGS and ATM sharing agreements with several other banks.

Chart 'D' The Bank Offers All Online Banking Options

■ No ■ Yes
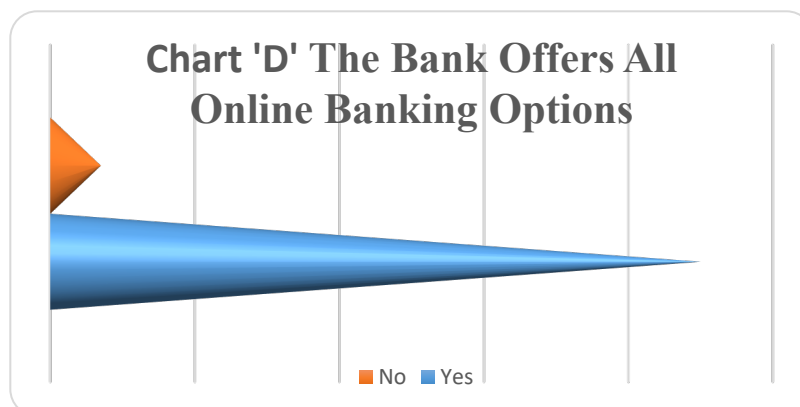
Whenever a bank professional phones consumers to promote items at inopportune moments, 72% of client's report feeling upset, while 19% said they don't care and occasionally acquire valuable knowledge. 5% of clients reported this because when they receive a phone call, the telemarketer usually asks if this is a suitable opportunity to speak or if they should call again afterwards. 4% of customers said they couldn't say.

Chart 'E' Users Get Upset Whenever A Bank Representative Calls
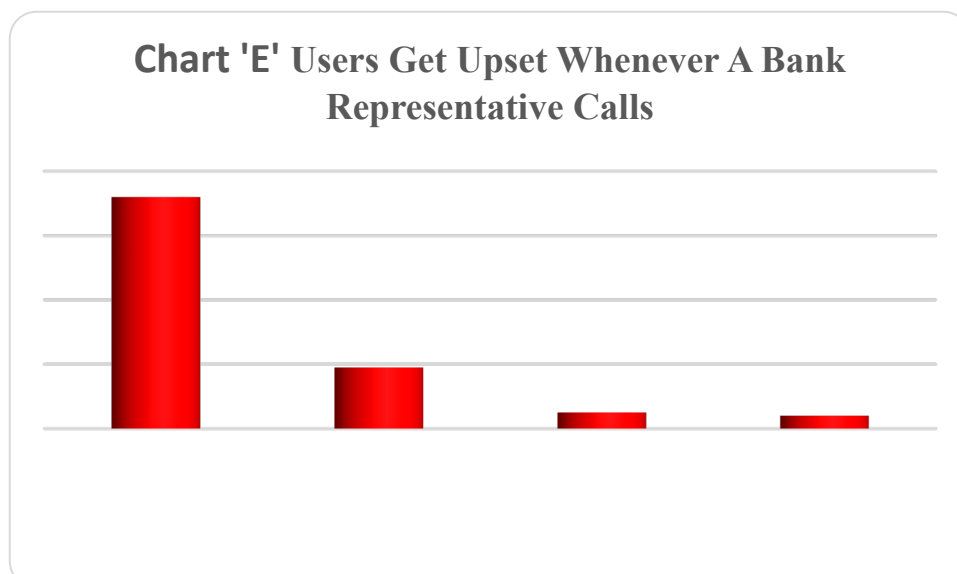
According to Chart "F," 52% of clients has enrolled for don't disturb, while 48% really haven't.

Chart 'F' Did You Set Up A Never Call List For Their Contact Phone?

According to Chart "G," 65% of respondents who responded to the survey believe that meeting requirements for monitoring acquiescence and promotional techniques for the bank's products are incompatible. As an outcome, the consultant at the bank is mis-selling more products


Chart 'G' Banking promotions and regulation are at odds with one another
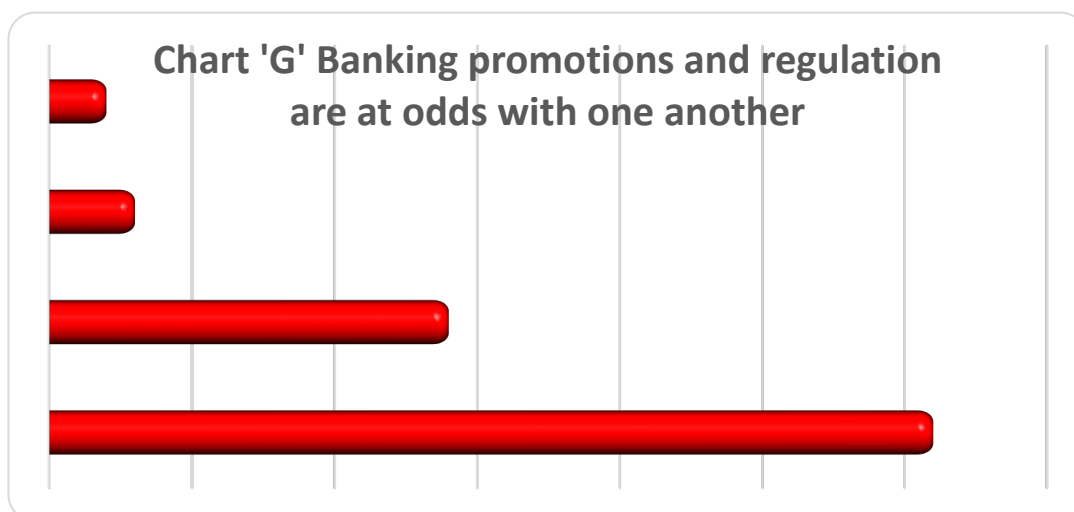
Development&AccumulativeTendencies of Retail AutomatedTransactions
Since 2012–2013, there have been rising tendencies in retailer digital payment size and value. Statistical assessment was investigated for the heightened client adoption and utilization of digital commerce.

Table 'E' : RTGS Accumulative Capacity from 2012-13 to 2015-16

Real Time Gross Settlement Capacity (in Millions)	2012-13	2015-16
Real Time Gross Settlement	67.46	97.93
Client Dealings	64.39	92.72
Cross bank Transactions	5.27	4.29
Cross bank Payment	.0087	.015

Chart 'H' RTGS Increasing Capacity from 2012-13 to 2015-16
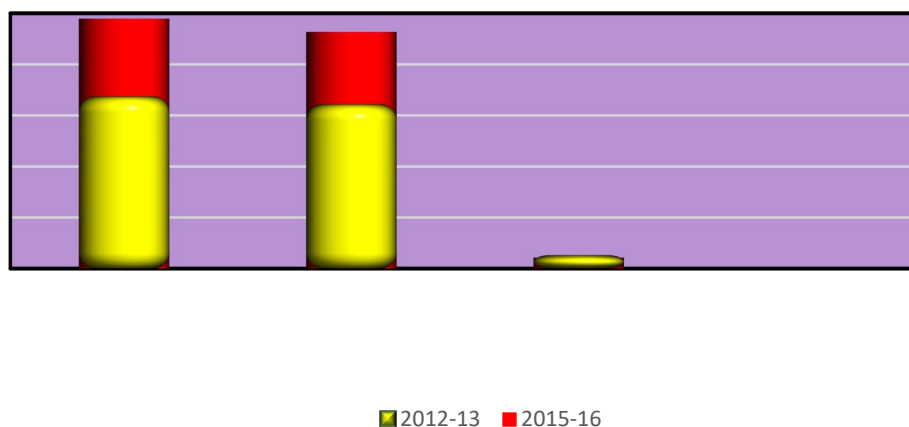
■ 2012-13   ■ 2015-16

The worth of NEFT transactions has climbed by Rs. 29034.72 in 2012–2013 to Rs. 83284.92 billion, a 219% growth in size from Rs. 392.49 million to Rs. 1259.73 million.

Table 'F' : NEFT Transfers

Year	NEFT Capacity	Millions
	2012-13	392.49
	2015-16	1259.73

Chart 'J' : National Electronic Funds Transfer

Year 2015-16; Millions; 1259,73

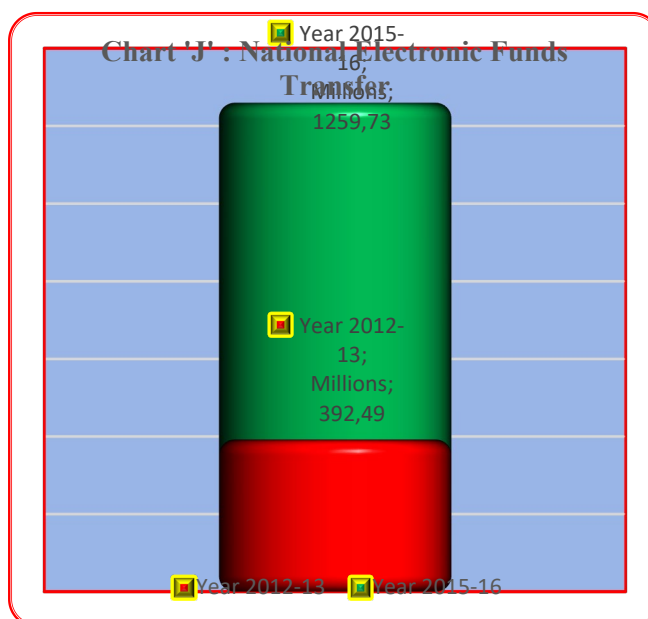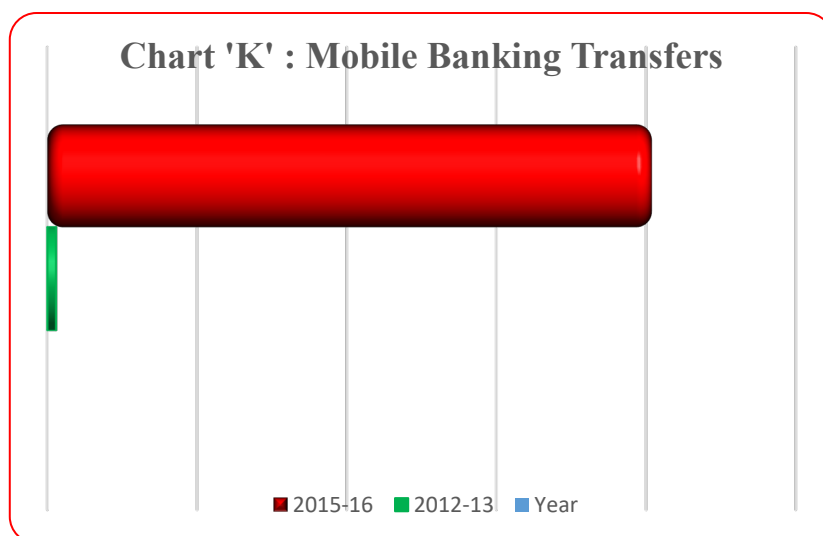Year 2012-13; Millions; 392,49

■ Year 2012-13   ■ Year 2015-16

Chart "K" shows a staggering growth in m- banking worth from Rs. 58.92 million to Rs. 4038.74 million between 2015 and 2016, or a 68.54% growth.

Table 'G': Mobile Banking Transfers

M- Banking Capacity Year	Million
2012-13	58.92
2015-16	4038.74

Chart 'K' : Mobile Banking Transfers

■ 2015-16   ■ 2012-13   ■ Year

While the amount of pixels of sale increased by 63% from 854294 to 1385672, the quantity of ATMSs increased by 87% during the span of four years, from 114018 to 212067.

Table 'H': Number of ATMs in Million

Number of ATMs	Million
Year	
2012-13	114018
2015-16	212067

Chart 'L': Number of ATMs in Million

■ 2015-16; Million; 212067

■ 2012-13; Million; 114018

■ Year   ■ 2012-13   ■ 2015-16
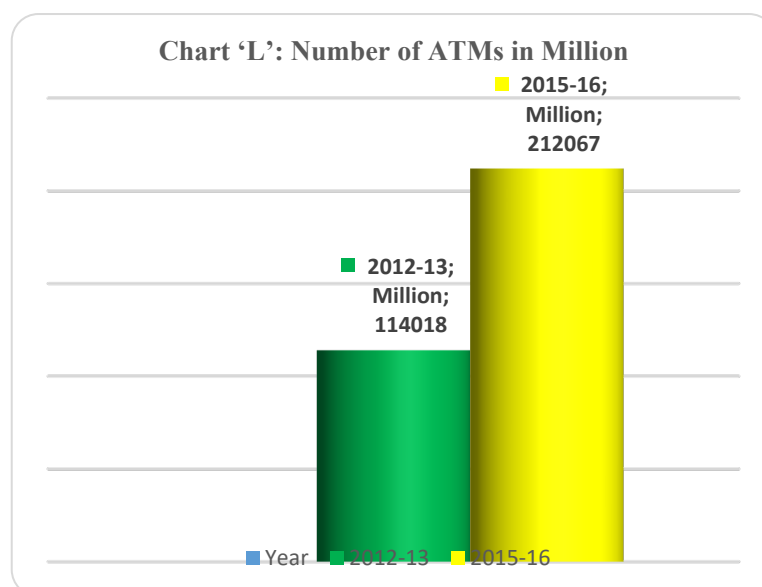
Table 'J': Number of Point of Sale Equipment in Million

Number of Point of Sale Equipment	Million
Year	
2012-13	854294
2015-16	1385672

Chart 'M': Number of Point of Sale Equipment
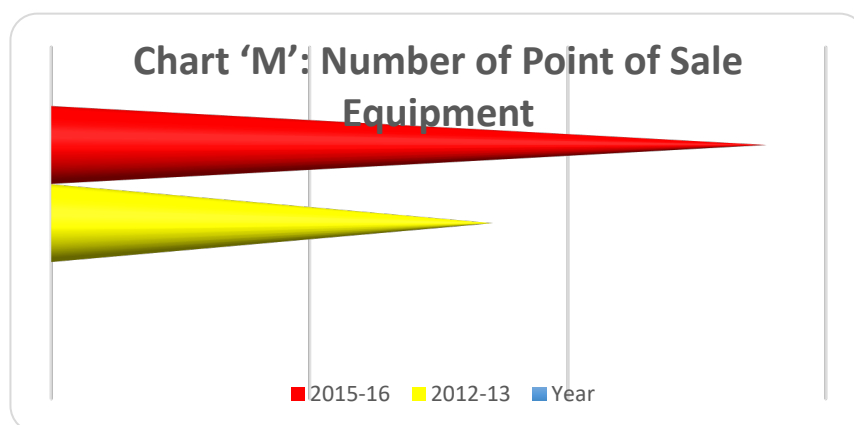
■ 2015-16   ■ 2012-13   ■ Year

While credit card transactions have increased slowly, debit card transactions have practically doubled.

Table 'K': Number of Credit Card Transactions

Number of Credit Card Transactions	Million
Year	
2012-13	20.28
2015-16	25.94

Chart 'N': Number of Credit Card Transactions

Million; 2012-13; 20,28   Million; 2015-16; 25,94
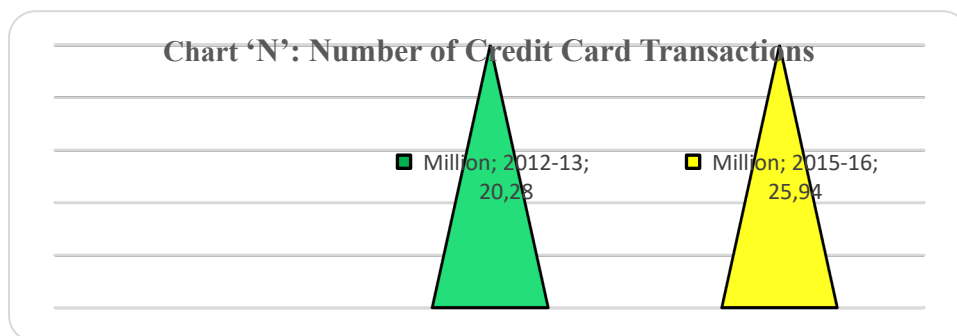
Table 'L': Number of Debit Card Transactions

Number of Debit Card Transactions	Million
Year	
2012-13	336.52
2015-16	664.79

Chart 'O' Number of Debit Card Transactions

Million; 2015-16; 664,79

Million; 2012-13; 336,52
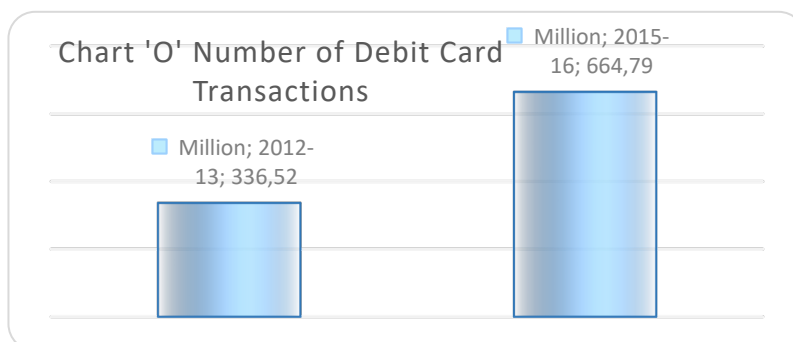
Designated payment operations in banks and permitted non-bank companies have increased significantly across both value and quantity.

**Table 'M': Number of Prepaid Instruments Transaction**

Number of Prepaid Instruments Transaction	Million
Year	
2012-13	68.29
2015-16	752.94

Chart 'P' : Prepaid Instruments Transaction
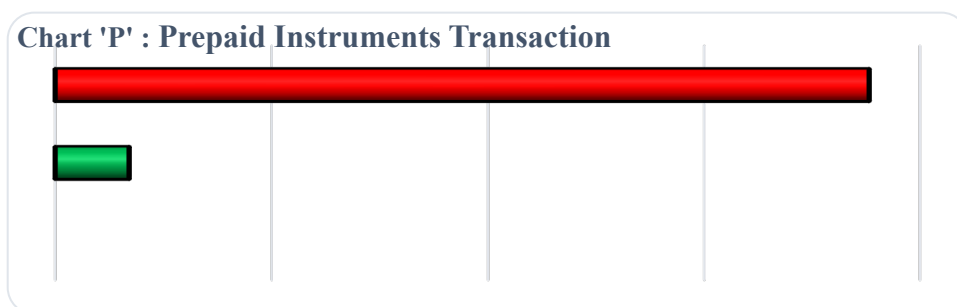
Immediate Payment Service: With the expansion of the Immediate Payment Service as an intern system offering consumers a variety of alternatives to initiate operations, the number and value of IMPS exchanges have also increased dramatically. [6]

Table 'N': Number of Immediate Payment Service Transaction

Number of Prepaid Instruments Transaction	Million
Year	
2012-13	1.36
2015-16	225.51

Chart 'Q' Immediate Payment Service Transaction
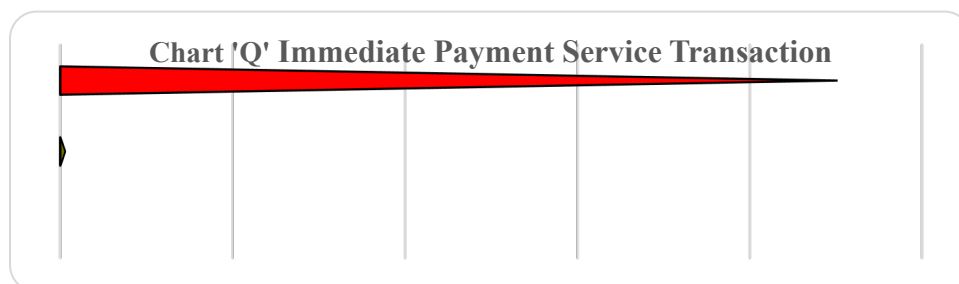
As Electronic Fund transfer Checking has superseded MICR Clearing, the study shown demonstrates diminishing patterns in Cheque transactions from 2013 and 2016 in terms of value and price.

Table 'O': Magnetic Ink Character Recognition Clearing

Number of Magnetic Ink Character Recognition Clearing	Million
Year	
2012-13	826.59
2015-16	No transactions available, since MICR clearing has been replaced by CTS

Table 'P': Paper based Clearing Cheque Transactions declining tendencies

Number of Paper based Clearing Cheque Transactions	Million
Year	
2012-13	279.38
2015-16	966.45

Chart 'R': Paper based Clearing Cheque Transactions decreasing trends
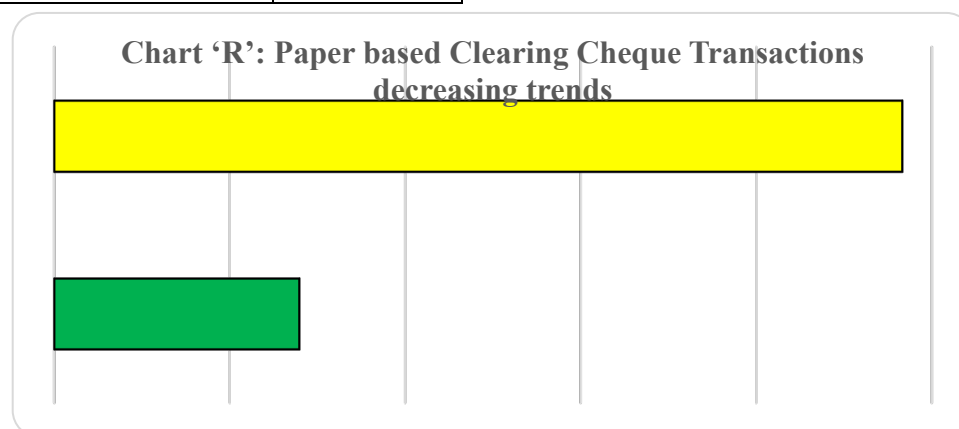
These essential criteria at this beginning to change that Indian bank clients underwent through conventional to electronic payment options is well shown by the current developments in electronic payments. By 2020, the MAPE Expert Panel, a financial institution, anticipates a 15000 Crore sector for internet payment services in the nation.

Findings: The following are the key conclusions of the study and bank interviews.

Significant obstacles that banks must overcome:

(i) Considering the expansion in the number of platforms, marketing expenses are expensive and profits are insufficient.Ignoring the fact that all bank records indicate prosperity, banks' proportion returns on investments have been trending downward. Banks must concentrate mostly on commercial properties and have accessibility to low cost capital. Banks are under compulsion to eliminate competitors.

(ii) Expanding respondents' perception and knowledge. The customer engagement and demands are evolving quickly because to modern electronic banking products including RTGS, NEFT, Net Banking, UPI, and m - banking. Banks take a long time to adopt new technologies due to the expense and are therefore unable to satisfy client demands quickly. Clients can alter their choices by using significance products, rewards programs, and redemption bonuses while using cards as well as other facilities.

(iii) Ongoing deregulatory efforts and escalating rivalry among banking tech firms. When more clients switch to online banking, the RBI recently published recommendations for the formation of an advisory committee to analyse the operation of Financial institutions. Several Fintech businesses are emerging IT online payment providers that provide banks technology. Therefore, it is important to maintain the integrity of clearing and settlement security and confidentiality.

(iv) Controlling force. On the other side, the RBI has established recommendations calling for stern measures to be taken towards banks and for penalties to be imposed for products mis-selling. In order to adhere to regulations and maintain safe data systems, banks must also pay significant sums.

(v) AlteredFreshGuidelines of Market. A global banking system has replaced the old banking system as a result of technological advancements. Customers of the global banking system receive all items and services under one roof. To suit client needs and keep competitive in the market, all national and private sector banks have switched to the global banking system.

(vi) Capability gap. Employing well-trained employees with solid domain expertise and advertising abilities is the biggest obstacle. At the moment of hiring new employees, two key considerations are interaction and character building. Sectionally items has the dual goals of getting referrals for new purchases while also selling and marketing innovative brands to their current customers. Cross-selling is crucial for growing the amount of clients and items offered, as well as for direct investing.

Level of ClientsFulfilment: According to client polling data, 65% of respondents are happy with the online banking services offered by their banks. According to the report, there are a number main aspects for improving company prospects, including demand loyal customers, brand recognition, and discovering different options while adhering to restrictions imposed. Dependable information security and lowering the associated risks with secure and anonymous electronic financial transactions have subsequently received increased attention.

Other elements that influence client purchasing decisions include confidence, dependability, availability, correctness, sensitivity, and speedy settlement of client queries when they encounter early online banking challenges. In the global banking system used for the promotion of financial sector, there is a favourable correlation between rising financial digitization and digital banking and rising customer experience. Additionally, it was discovered that banks are engaging in unscrupulous business methods while marketing bank services as a result of the intense obligation to meet expenditures and objectives. Authorities including the RBI, IRDA, and SEBI have issued warnings that banks which use aggressive advertising strategies without providing the full specifics of the product may face severe penalties.

CONCLUSION

According to the study described above, online banking had a crucial role in the evolution of the traditional financial system into the current universal banking system. Banks have been encouraged to begin their product offerings using the modern set of rules by key developments in the use of e-payment systems, with a particular emphasis on digital money, online banking, and money transfer. The banks are starting to catch up to satisfy the client's needs, and the degree of service quality has climbed to 66%. Mis-selling of financial services was the major cause of the rise in consumer complaints, and the tension among company goals and legal requirements is to blame for this. This study demonstrates the necessity to segregate the roles of marketing and administrative adherence, and the requirement for specially educated bank employees to comprehend client needs and provide the best options in order to assure effective product placement.

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RESEARCH ON THE MOTIVE FOR INCREASED CLOUD ADOPTION AFTER THE COVID-19 PANDEMIC AND FUTURE CHALLENGES

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ABSTRACT:
Many industries have been actively planning to migrate to the cloud and move their businesses to the cloud since the world entered the Covid-19 pandemic. There are many motives because the cloud is a compelling enabling technology that serves as the definite solution for accessing IT systems and software. It is the new imperative for companies seeking digital transformation. Remote work is now a prevalent situation in all IT companies in continuous operation. Covid-19 has made cloud adoption an essential priority rather than a steadily approaching future transformation. The advantage of the cloud is that the employees of a company, not the engineers, are no longer relied on closed, hardware-based IT infrastructures and therefore no longer must work in networked offices. This has created a high demand for trained cloud specialists who are experts to manage and support systems running in the cloud in different parts of the world. This study mentioned the motives in the back of the growth in cloud adoption after the Covid-19 pandemic and mentioned the demanding situations going through organizations.
Keywords: Covid-19, Cloud, Pandemic, Cloud Adoption, Cloud Migration.

Introduction:
Cloud computing has been round within side the IT enterprise for years, so it is now no longer a brand-new term, however what precisely are cloud computing and IT companies adopting cloud computing quicker than ever before? Why? Why have pandemics like Covid-19 pressured positive companies to remember and plan to undertake cloud computing? By making quite a few computing offerings, including storage, and community offerings to be had over the Internet, bendy access, fast innovation, decreased infrastructure costs, and the supply of end-person systems. It offers higher scalability and higher security. It additionally gets rid of the trouble of preserving on-premises infrastructure and pay-as-you-go together with an on-call for transport model.

Important Advantages of the Cloud during the Pandemic:
1. Remote Working Solution:
Remote work means you can work from anywhere. This practice has existed in some large companies for years, but with the Covid-19 pandemic in March 2020 and the imposition of lockdowns, employees around the world have been forced to stay at home. It's true merit and importance were realized when it was forced to do so. It seemed that it's the only way to control the virus spread. The corona virus during pandemic is affecting all aspects of life at all levels, and IT / any other domain corporate work cultures are no exception.
But companies with infrastructure based on cloud and skills have been able to sustain this dramatic shift in the workplace because they have solutions for remote work in the field.
Many businesses have started to reap the advantages of cloud adoption in this pandemic situation. [1].

2. Business Stability:
Businesses with sturdy cloud-primarily totally based IT infrastructures were capable of feature properly all through the pandemic that affected all corporations. Safe and rapid get admission to included information is a key component in retaining your commercial enterprise running. By storing your information within side, the cloud, it is constantly secure and stable any place you get admission to it.[2], diverse governments have begun imposing lockdown measures throughout cities Since March 2020 throughout cities and international locations because the pandemic spreads across the world. This has affected diverse corporations as their worker appearances are confined with some exceptions.

This has caused elevated use of digital gear and era to live linked to the commercial enterprise inside this quick timeframe. Various online conferencing systems along with Google Meet, Zoom, Microsoft Teams, and Webex have stated a surge in sales, with Zoom seeing a sales growth of over 100% because of the rise within side the use of the virtual digital era.[3]

3. Effective Collaboration:
Companies with more employees need to work together daily to operate as an efficient team. Instead, keeping the teams collaborates and connected during work hours is a top priority. The cloud has made this collaboration much easier in terms of the complications it offers. You can connect via video conferencing, share official content and information, and discuss securely in groups via cloud-based platforms. Collaboration might be possible without cloud computing solutions, but collaboration keeping it simple and seamless is a key factor when different

employees work in different locations. Cloud computing helps this collaboration easier. All the members in team can share the information and execute the work in collaborative way. Some cloud-based services provide social collaboration spaces to connect employees across the organization to increase their interest and engagement. Collaboration can be done without cloud computing solutions, but it is not as easy or effective as cloud-based solutions. All this will help to improve efficiency and performance.

4. Distance Education:
The pandemic has forced various government to close all educational institutions and students are forced to study from home through online mode. Educators enabled online mode of solutions for all academic stakeholders such as students & teachers before the pandemic by deploying virtual solutions (Boukil and Ibriz, 2015) such as Microsoft Teams, which not only provide remote video lessons but also a platform for learning, sharing materials and homework by age group [4]. Through these platforms, teachers can develop close connections with their students. It is a easiest way to attend online classes from anywhere. With video-enabled online learning platforms, teachers and students stay engaged during lessons, and parents can check their kid's performance displayed when participating in online lessons (Craig, 2015).

5. Cyber security:
With cloud computing, the infrastructure is closely held and managed by the cloud supplier. Corporations or organizations that use the cloud invariably have some issues concerning the safety of their information and files, as they are doing not grasp wherever and the way the cloud provider secures their data. Public and personal organizations have endowed ample greenbacks in security merchandise, however, haven't tested the efficiency of these protections and therefore the individual's victimization the techniques. However, cloud service suppliers have verified that they unendingly monitor client information and files with the most recent security policies and services. With a shared responsibility caterpillar-tracked model within the cloud, it's important for businesses to monitor, identify, and right all possible threats and misconfigurations to equipped cloud resources.

6. Scaling:
Cloud-based infrastructure may be a nice answer for some corporate sectors because it permits them to scale up/downsize their IT resources expeditiously and quickly supported business desires. It's ideal for businesses with ever-changing needs. As demand grows, the cloud can offer mandatory infrastructure and services without concern regarding physical infrastructure. This cloud flexibility allows businesses to manage prices effectively while not deed any resources unused. Organizations adopting Cloud-based solutions are ideal for businesses with growing or unsteady information measure needs. If your business needs grow, you'll be able to simply expand your cloud capacity while not having to speculate in physical infrastructure. This level of flexibility will provide firms mistreatment cloud computing a true advantage over their challengers.

The cloud's auto-scaling/ alignment capabilities eliminate risks associated with on-premises infrastructure operations and maintenance issues. No upfront costs and controlled spending's are the biggest advantages of cloud-based business.

7. Endless advantages of Cloud adoption:
Apart from high availability, scalability, business continuity, disaster recovery, fault tolerance, and flexibility, there are several new awesome features and services has been seen over time with growing interest in cloud adoption by numerous companies. Initially, Amazon net Services emerged as a property cloud supplier, however these days there are a range of cloud suppliers together with Microsoft's Azure, Google Cloud, IBM Cloud, and Oracle. Every cloud provider has superiority over others in various areas such as networking, storage, security, computing, and availability.

Popular Cloud Services during Covid-19
Companies that use the cloud to host their applications and create them firmly accessible over the web employing a sort of cloud services. The table below in Figure no 1. shows the Cloud services that were used most by four completely different Organizations victimization AWS (Amazon net Services) because the Cloud supplier for his or her three applications.

S.No.	AWS Cloud Services	Service type
1.	S3	Simple Storage Service
2.	EC2	Virtual Machines
3.	Cloudfront	Global Content Delivery Service
4.	RDS	Relational Database Service
5.	SNS	Simple Notification Service
6.	IAM	Identity and Access Management
7.	VPC	Virtual Private Cloud
8.	AutoScaling	Scaling Service
9.	Elastic Load Balancers	Traffic Distribution Service
10.	Beanstalk	Platform as a Service
11.	Lambda	Serverless Computing Platform

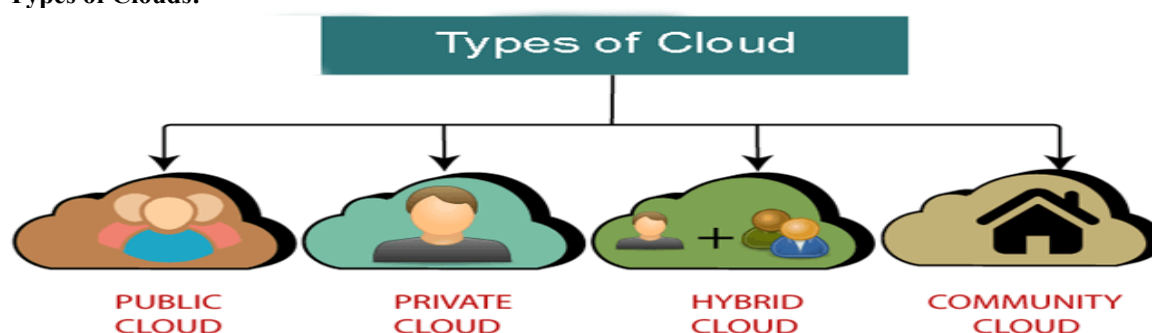**Figure 1. Popular AWS Cloud services**

Types of Clouds:

Figure 2. Types of Cloud

There are mainly 4 types of cloud as shown in above figure.
Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud. These clouds differ from each other as per their deployment style.

Operational Models of Cloud computing:

Figure 3. Below shows different Cloud Service Models have different level of administration and the type of user responsible for managing the administration.
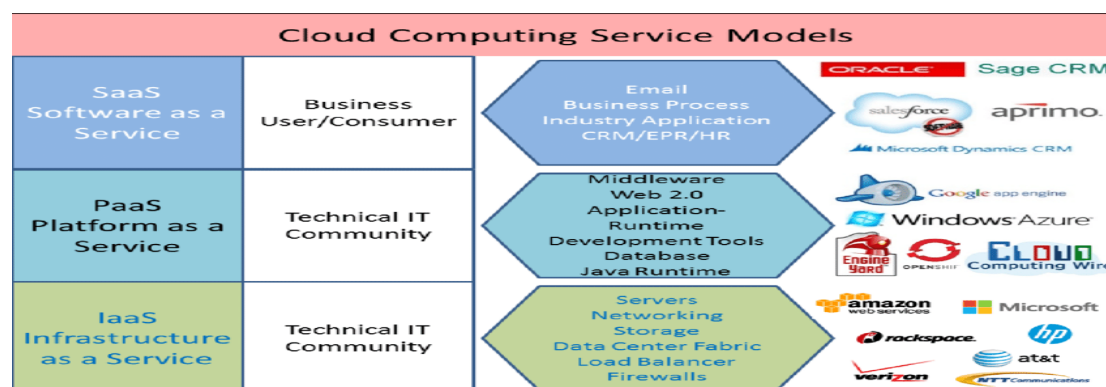

Fig.3 Cloud Computing Service Models

There are mainly 3 cloud computing service models namely SaaS, PaaS & IaaS. These 2 models differ as per their way of service they provide. The diagram shows the end user community, types of services they provide and examples of some services from each category. Apart from these 3 main services, there are Cloud vendors such as Database as a Service provide many other services, Network as a service, Storage as a service etc.

Cloud is the new normal:

Cloud computing evolves rapidly much in last 10-12 years. The company's claims to security and resilience were established time and time again once his JEDI value $10 billion, one of the United States Department of Defense's biggest projects, was bagged by Microsoft's Azure. Cloud adoption has many advantages. It's proved that the cloud can become the enterprise technology infrastructure of the future, and almost every organization ought to adopt the cloud slowly. However, the use of cloud has declined since the Covid-19 pandemic began in March 2020. Many Corporate sectors have already experienced and recognized the ability and advantages of the cloud for creating their business operations additional resilient and available. Cloud computing plays a more and more necessary role in guaranteeing the smooth delivery of services. This is evident throughout the Covid-19 pandemic, opening opportunities to seamlessly deliver additional new services. In April 2020, in response to Covid-19, Google have its own on-line meeting platform Google Meet free for the primary sixty minutes in this free version of the SaaS application. The employment of the many different video conferencing tools has conjointly redoubled dramatically since the covid-19 outbreak.

Since then, its daily user count on Microsoft Teams and Zoom has grown, and Google Meet is no exception. Its daily usage of video conferencing tools for such SaaS applications is 30 times what it was pre-Covid-19. According to the study, IT professionals such as computer scientists, architects, programmers, and developers fall into the lowest risk percentages of 0-20%.

This is clearly due to the remote working capabilities provided by the IT infrastructure most companies use. Further increases in digital transformation and cloud adoption can further reduce the risk factor caused by Covid-19 infection. This is a signal to prepare for future pandemic situations.
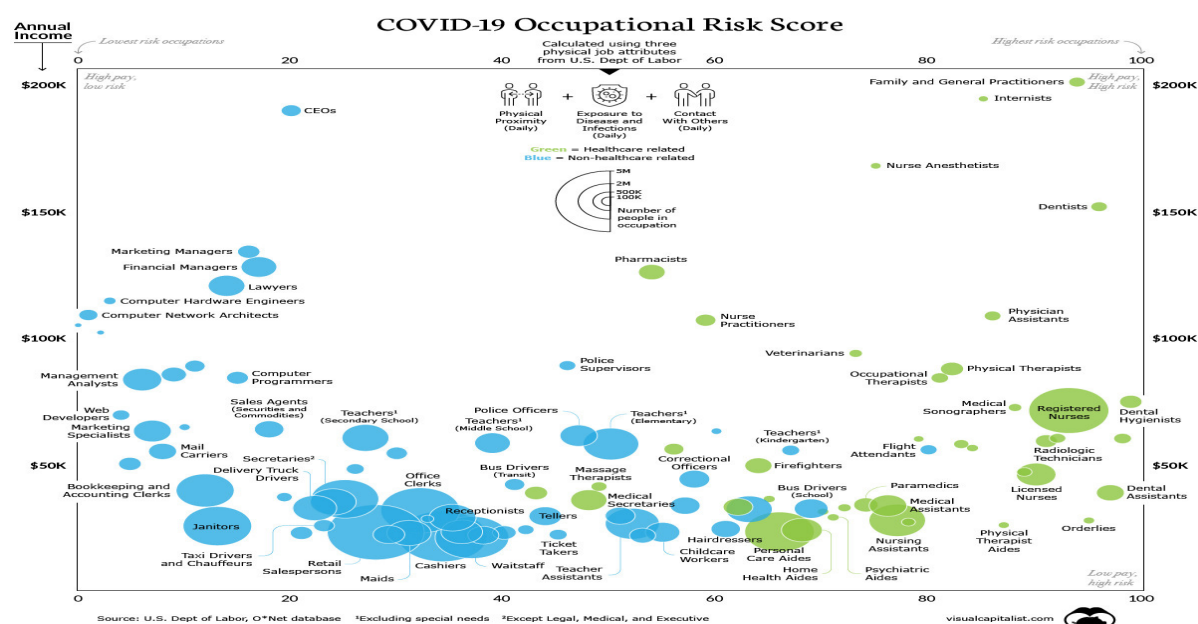

Figure 3. Risk Score of Various Occupations

Challenges:

Challenges always come along with the benefits. Few challenges faced by cloud user are as given below,

1. Data Securities and Protection:

The means to ensure the security of the data and how the data is accessed should be clearly defined by the service provider and communicated to the organization (Grover and Johari, 2018. Data in transit, data in rest both should encrypted, and the level of encryption can be determined collectively (Jian, 2015). Data security in cloud environments is more complex than data security in on-premises or traditional information systems because data is spread across different locations on different devices.

2. Data Location:

Many countries have data privacy and security laws, so it is important to know where your data is physically located. Data may need to reside on multiple continents for high data availability (Sun, Zhang, Xiong, and Zhu, 2014)

3. Skills shortage:
To recruit & retain people with good cloud skills is difficult during cloud adoption. Having skilled cloud-certified professionals at intervals your organization is dominant to start the method of your cloud journey, and if you have shortage of such engineers then it will be a major challenge to continue this journey.

Conclusion:
During Covid-19, the cloud will enable remote access to data, storage of data, and execution of operations from remote locations to ensure business continuity process and risk mitigation of operational systems. is clearly essential to It also shows that organizations with strong cloud capabilities have performed much better during these pandemic times compared to those with on-premises infrastructure. It is accelerated migration faster than ever before.

The Covid-19 experience provides the value of cloud as a key factor in reducing enterprise risk. In addition to providing continuity of service, it has enabled enterprise remote work capabilities and eliminated the need to be physically present at an office workstation. Many giant and medium-sized businesses believe the cloud it's seen as a crucial process factor, that is why we are reviewing our strategy for future work. The cloud comes with specific new responsibilities to suits local privacy and security laws (Khan,2014) and guarantee appropriate security mechanisms, including coding and vulnerability management. Due to some known challenges, the current pandemic situation makes the longer term of business continuity additional unsure and unstable, thus avoid adopting cloud for new comes and relocation of legacy applications (Gokarna and Mayank, 2016).

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SHAPING THE FUTURE OF HOTEL INDUSTRY: RESILIENCE BUILDING PERSPECTIVE

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ABSTRACT
Organizational resilience is linked to the processes, routines, and resources of the company. Cross-level resilience includes people, groups, and organizations, and depends on the relationships between several levels. Resilience however is a procedure that is affected by the resources and routine of organization. In a discontinuous, emergent internal and external environment, resilience is a capability. A potential capability of an organization that cannot be seen in its day-to-day operations is its organizational resilience. Organizational resilience can benefit management, nevertheless, when the environment starts to change and become disruptive. Defensive techniques are employed by companies in an effort to avert undesirable outcomes. Organizations with progressive tactics, on the other hand, work to influence favourable occurrences through their actions. The objective of this study is study resilience building perspective of hotel industry. The researchers have collected the data from 200 respondents using survey method with the help of well-structured questionnaire. The researcher identified that descriptive research design and Non probability convenience sampling method is suitable for the research study. The findings of this study will be useful to many companies to sustain in the competitive world.
Keywords: Organizational resilience, Hotel industry, Strategy, Change, Performance etc.

Introduction

Businesses must be resilient to respond to disturbances and successfully adapt to difficult circumstances, seizing opportunities and achieving long-term performance improvement. Simply put, senior executives must "insure" against negative events while also adapting and changing before the cost of doing otherwise becomes unaffordable. Finding best practices for organizational resilience presents a difficult task, not the least of which is the conflicting advice that may be found in many information sources. In order to address this problem, BSI collaborated with Cranfield School of Management to compile the most up-to-date research on organizational resilience, explore how it has developed as a concept, and learn more about best practices employed by globally renowned companies.

Importance of Organization Resilience

- Heightened capacity for recognizing and addressing opportunities and risks
- Become adept at identifying and addressing weaknesses before exerting any significant effect
- Combine methods to incorporate management disciplines of the present that support organizational resilience
- Improve your knowledge of the relevant players and dependencies supporting strategic objectives
- Foster a culture of shared objectives and principles

Organization Resilience principles

- Leadership

Operational and tactical planning will provide more fruitful outcomes, and leadership skills will improve.

- Organizational performance

Lessened costs associated with disruption, including less insurance payments and less exposure to uninsured losses. An elevated status among shareholders. Improved capacity to recruit quality employees; increased market share

- Be ready to change

Improved awareness of new dangers from the outside. Greater capacity for developing original ideas; - Greater capacity for utilizing calamity for growth and transformation

Any area of enhancing organizational capability can benefit from these traits, and success will be assured if they are encouraged and established within the company. If the company didn't figure out how to handle the minor events that happen every day, they might escalate into a huge incident.

Strategies of Organization Resilience
Seven strategies for fostering organizational resilience are listed below:
- Maintain an Upbeat Attitude
Always maintain a positive attitude and focus on what can you control.
- Prioritizing profit
The key to organizational resilience is profitability. A profitable company will have cash flow and reserves that will allow it to weather difficult times and adapt to change.
- Decide on Your Goal
Our actions are driven by a sense of purpose. You can start by stating why you want to launch a small business or why you are a small business.
- Increasing Wellness Resources
Work requirements can occasionally alter gradually and occasionally abruptly. Organizations would be wise to make sure that their most valuable asset their people are empowered holistically as employees adjust to these changes.
- Lead with clarity and receptivity
In times of upheaval, resilient companies have active leadership in place. Organizations that lack effective leadership run the risk of becoming a fractured team.
- Adopt agile methods
Agile project management, which promotes organizational resilience, is based on the fundamental idea that your team can change course and respond to changes as needed.
- Maintain Regular Contact
Stakeholder communication is even more crucial when your organization is undergoing change.

Hotel industry
Hospitality is term which presents the friendly treatment or acceptance given by one people to another people or stranger or guest. The word "Hospitality" is all about the art of accepting, entertaining or receiving guests, visitors, or strangers. Nowadays peoples are offering hospitality by their own. There are many different theories about how to offer hospitality to their guest. Because are various traditions and cultures in all over globe. Many people offer hospitality to the stranger person who came their home for food, shelter etc. These hospitalities help many people to survive in society specially the person who have outside from their home town.

India is a country which believes "Atithi Devo Bhavah". The meaning of hospitality is "caring of strangers". Many hotels in India were developed before the World War II in the areas which are populated by India's British aristocracy. In this period the development of hotels are comes under Individual India's British entrepreneur. Nowadays in Pune city, there is many good, royal and top-range hotels are available like Hyatt Regency Pune &amp, Residences, Novotel Pune Nagar Road, Royal Orchid Central Pune, The Orchid Hotel, Lemon Tree Hotel, etc. Below are the top star hotels in Pune city in 2022.

1. The Ritz-Carlton, Pune
2. Conrad Pune Koregaon Park by Hilton
3. JW Marriott Pune
4. Marriott Suites Pune
5. Vivanta Pune, Hinjawadi
6. Hyatt Regency Hotel & Serviced Apartments Pune
7. Sheraton Grand Pune Bund Garden Hotel
8. DoubleTree By Hilton-Pune Chinchwad
9. The Westin Pune Koregaon Park
10. Sayaji Hotel Pune

Organization resilience and Hotel industry
The tourism industry is extremely vulnerable because of its high level of complexity brought on by the participation of various factors, including hotel chains, airlines, tour guides, and travel agencies, among others. Through preparation and ability for adaptation, hotel companies adopt a resilience-oriented approach. It makes sense that hotel workers are really concerned about preserving their employment and getting paid the same as they did before the Covid-19 outbreak given the fragile business environment. Resilient hotel As previously mentioned, strategy and change dimensions play a role in an organization's capacity to handle challenging circumstances and be resilient. But another method of analyzing resilience can be done by looking at the activities or objectives of a resilient organization. The tourism industry has experienced some serious obstacles. This study examines the nine categories of change mentioned in the literature, including those relating to the

economy, regulation, policy, technology, environment, competitors, customers, intermediaries, suppliers, other partners, and/or external agents.

The tourist sector is especially vulnerable, in part because of its high level of complexity and activities' global scope. The effectiveness of tourism agents, including hotels, is affected by a number of developments, both positive and bad. Changes in the tourist industry include crucial events that might affect how well hotels perform, such as those involving competitors and clients, strategic partners, technical advancement, economic crises, political-legal concerns, and environmental factors.

Literature Review

In all regional economies, it is crucial to comprehend the financial stability of large firms and the nature of their supply chains. This supports the proportionality principle, which directs interventions at the regional level. Particular businesses and geographical areas are far more vulnerable than others. Therefore, in the context of severe shocks and longer-term disruptive processes, national and regional authorities may need to alter support systems accordingly to assist some organisations survive in the short/medium term. It's significant that the studies in this research have wider implications for sectoral and regional resilience Amir Qamar, Simon Collinson & Anne Green (2022).

In addition to emphasising chances to integrate and build upon existing knowledge, this article examines growing research trends and routes for future research, outlining prospects for more research into resilience in business and management studies Martina K. Linnenluecke (2015).

Resilience and the significance of economic structure in how areas respond to recessions, Regional Studies. The four significant recessions of the past 40 years—1974–1976, 1979–1983; 1990–93; and 2008–2010—are examined in this study to see how employment in the major UK areas has responded. To analyse these responses, the concepts of resistance and recoverability are applied. From one economic cycle to the next, the research shows both considerable shifts and continuities in the regional impact of recession. Additionally, although economic structure is found to have had some impact on the resilience and recoverability of some regions, overall, "region-specific" or "competitiveness" impacts appear to have been at least as important, if not more so Peter sunley (2016).

Resilience is quickly becoming recognised in policy discussions as a notion "whose time has come"; a new imperative of "constructing" or "creating" regional and urban economic resilience is gaining popularity. But it's possible that the haste with which the concept of local and regional economic resilience has been adopted in policy circles has outpaced our comprehension of it. There is still a lot of confusion surrounding the definition of regional economic resilience, how it should be understood and assessed, its causes, and its relationships to long-term regional growth patterns Ron Martin, Peter Sunley (2015). The analysis pinpoints the causes of why some airline businesses recovered after the attacks effectively while others failed. Layoffs following the crisis may have hampered recovery instead of fostering it throughout the course of the four years that followed. However, there was a direct link between layoffs following the crisis and a lack of cash reserves and a workable business plan before the crisis. Further investigation reveals, according to the authors, that the creation and maintenance of relational reserves throughout time were essential to the viability of a company model Jody Hoffer Gittell (2006).

The efficacy of an organization's culture and leadership style are directly correlated, according to Sharma and Kirkman (2015); The nature of the interaction between a leader and follower influences results like commitment (Wang et al., 2010). (Wang et al., 2010). Lower organisational effectiveness could be the outcome of an ineffective leadership style that is inconsistent with the company culture and demotivates employees (Steyrer et al., 2008). Muchhal (2014) discovered that creative and nurturing organisational cultures were linked to employees' commitment, and that effective leadership behaviours might raise that commitment (Haque and Aston, 2016). Liu et al. (2013) assert that workers will exhibit good attitudes and actions when they believe that the hotels are fulfilling their psychological contracts, promises, and commitments to them.

As quality travel preferences change, other forms of travel are replacing mass tourism. However, the pandemic has caused behavioural changes; people are now more concerned about their safety, health, and the environment in addition to being more environmentally conscious and worried about the future (Başer & Ehtiyar, 2021). The ecosystem is changing, growing, and evolving into something different than it was before the global pandemic of (Brouder P 2020). Optimism for environmental rehabilitation can be linked to ecological despair (Crossley É. 2020).

Gretzel et al. (2020) have provided the "six revolutionary e-tourism research pillars" for proactively utilising IT resources for both short- and long-term goals in order to revolutionise the e-tourism industry. Equity refers to the equitable distribution of goods and services, including measures to address the misalignment of social and political norms (Gooden, 2015). Governmental social equity acknowledges the crucial role that institutions and public servants play in preserving democratic equitable principles. However, due to China's system and economy, there is still inequality in the areas of education, social assistance, and other social policies (Zhou & Zhu, 2019).

Research Methodology
Objectives of the study
- To study the concept of organizational resilience.
- To study the types of attributes and changes in hotel industry

Hypothesis of the Study
H1: There is a significant impact of strategy dimension on hotel resilience.
H2: There is a significant impact of change dimension on hotel resilience.
H3: There is a significant impact of hotel resilience on hotel performance.

Scope of the study
- This study is related to only star hotels.
- Pune city is considered as geographical area for the present study.

Following methodology was designed for the study to collect primary data.
a. Identify a sample of 200 customers from Pune City, using convenience sampling.
b. Design and validate questionnaire
c. Seek responses on a 5-point frequency scale.
d. Conduct the survey
e. Summarize the responses
f. Analyze the results

Scheme formed for testing of hypotheses
a. Responses were collected under 2 sections
b. For each of the sections an average was calculated.
c. Percentages to questions under a particular section of the questionnaire were averaged to get a single score for that section,
d. P-values were calculated, and the null hypotheses were checked for rejection or non-rejection.

Research design

| Type of Research Design	Descriptive Research Design
Sampling Technique	Non-Probability Convenience Sampling
Sampling Area	Pune City
Sample Size	200 employees in Hotel industry
Primary Data	Well-structured questionnaire
Secondary Data	Research papers, Articles, Books, Journals etc.
Data Analysis tools	IBM SPSS-20 and Ms Excel-2010

Data Analysis

Age of the Respondents

Age	Frequency	Percentage
21 to 30	60	30
31 to 40	60	30
41 to 50	50	25
51 & above	30	15
Total	200	100

Age of the Respondents

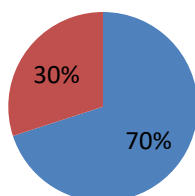■ 21 to 30 ■ 31 to 40 ■ 41 to 50 ■ 51 & above
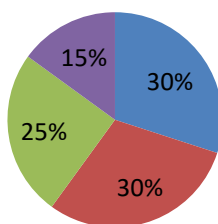
Gender of the Respondents

Gender	Frequency	Percentage
Male	140	70
Female	60	30
Total	200	100

Gender of the Respondents

■ Male ■ Female

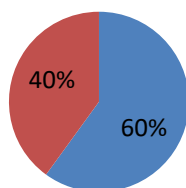**Marital status of the Respondents**

Marital Status	Frequency	Percentage
Male	120	60
Female	80	40
Total	200	100

Marriatal Status of the Respondents

■ Married ■ Unmarried

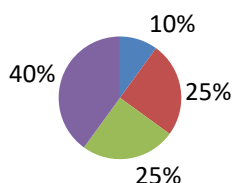**Income level of the Respondents**

Income	Frequency	Percentage
Below Rs. 3,00,000	20	10
Rs. 3,00,000 to Rs. 6,00,000	50	25
Rs. 6,00,000 to Rs. 9,00,000	80	40
Above Rs.9,00,000	50	25
Total	200	100

Income of the Respondents

■ Below Rs. 3,00,000 ■ Rs. 3,00,000 to Rs. 6,00,000
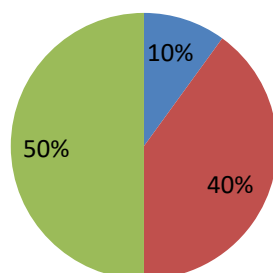■ Rs. 6,00,000 to Rs. 9,00,000 ■ Above Rs.9,00,000

Managerial level of the Respondents

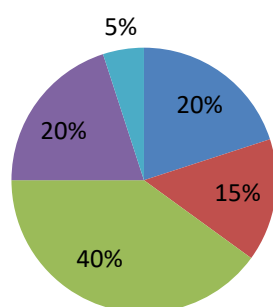| Managerial Level	Frequency	Percentage
Upper Management	20	10
Middle Management	80	40
Lower Management	100	50
Total	200	100

Managerial Level of Respondents

Work tenure of the Respondents

Work Tenure	Frequency	Percentage
0-5 Years	40	20
5-10 Years	30	15
10-15 Years	80	40
15-20 Years	40	20
20 Years and above	10	5
Total	200	100

Work Tenure of the Respondents

Types and Attributes of Changes

Types of Changes	Attributes		
	Impact	Frequency	Predictability
Competitors	4.05	3.2	4.1
Customers	4.45	4.3	4.15
Intermediaries	3.5	3.2	2.8
Suppliers	3.1	3.15	3.35
External agents	2.8	2.25	2.6
Economic Impact	4.35	2.5	2.8
Political Impact	4.1	3.2	2.7
Technological Impact	3.9	3.65	3.35
Environmental Impact	3.15	2.2	2.3
Mean	3.72	3.07	3.12

Types and ASttributes of Changes
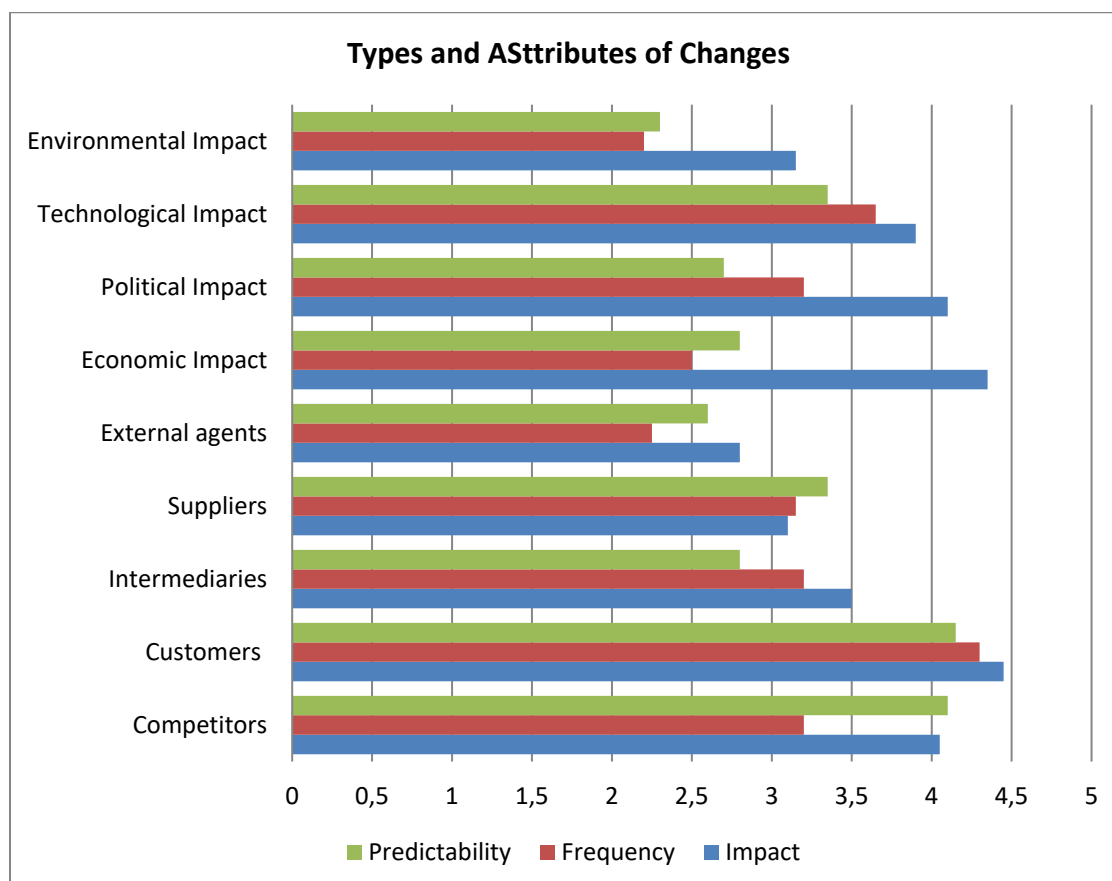
Evaluation of the measurement model

Construct Items	Loadings	t	rho	Composite reliability	AVE	Cronbach's α
Strategy						
Identification of suitable strategies	0.82	9.65	0.845	0.89	0.615	0.824
Continuous strategic vision	0.78	17.445				
Updated business strategies	0.84	19.456				
Learning from experiences	0.75	12.56				
Relationship development	0.825	14.15				
Change						
Knowledge development	0.83	12.854	0.954	0.945	0.648	0.886
High quality products and services	0.854	24.946				
Strong commitment towards customers, suppliers, intermediary and employees	0.885	22.294				
Continuous improvement	0.825	18.854				
Promotes creativity	0.845	32.016				
Organizational changes	0.832	19.545				
Hotel resilience						
Adapting to changes in the environment	0.824	21.458	0.845	0.956	0.796	0.878
Recovers and strengthens at a strategic and operational level	0.96	31.225				
Adapts new environmental conditions	0.894	24.454				
Performance						
Average sales growth	0.687	7.145	0.864	0.89	0.635	0.865
Average market share growth	0.798	15.457				
Hotel image and reputation	0.75	8.475				
Customer loyalty	0.842	28.245				

Hypothesis Testing

Relations	β	*t*-value	R2	Q2	f2	Hypothesis
Strategy → Hotel resilience	0.524	5.14	54.50%	0.412	0.518	Accepted
Change → Hotel resilience	0.328	3.865			0.228	Accepted
Hotel resilience → Performance	0.468	5.98	24.50%	0.135	0.285	Accepted

From the above table we can say that there is a positive impact of strategy on hotel resilience ($\beta = 0.524$, $p < 0.001$) so hypothesis H1 is accepted. Also, there is a positive impact of change on hotel resilience ($\beta = 0.328$, $p < 0.001$) so hypothesis H1 is accepted. It is also observed that hotel resilience has a significant impact on hotel performance ($\beta = 0.468$, $p < 0.001$), so hypothesis H3 is also accepted.

Conclusion
From the present study it is observed that there is a major impact of customers and economical changes in the country on the hotel industry. It is also observed that Strategy and change have significant impact on hotel resilience and hotel resilience have significant impact on hotel performance. This research will be beneficial to

academicians, students and industries. Hotel organizations can design new strategies related to organization resilience with the help of this research study. There is also scope for further research in this study related to organization agility, organization resilience in travels and tourism sector, hospitality sector etc. etc.

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STOCK VOLATILITY AND RETURN ANALYSIS: A COMPARATIVE STUDY OF SELECT AUTOMOBİLE COMPANIES IN INDIA FOR INVESTMENT DECISION MAKING

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ABSTRACT
This study is about the comparative analysis of vitality and return of stock prices of selected automotive companies. Due to impact of Pandemic 19, many automobile companies are still facing challenges related to production, supply chain, marketing & financing, many investors are preferring stocks of Pharma, health care and IT sector. The growth of these companies is not up to the mark as of now. To attract the investors towards automobile companies it is important to know the stability and return analysis of the stock prices of these companies. Here three companies are selected to conduct comparative analysis of vitality of stock of automobile companies. This analysis resulted to find the less volatile stock and steady return analysis for investment purpose. Various statistical tools such as standard deviation, average return, daily return and variance are used to analyze the data.
Keywords: Volatility, stock, standard deviation.

1. **Introduction:**
Valuation of equity share guides to the manager to run their companies in an increasingly competitive world. Managers can learn to make decisions that improve their firms and generate genuine value by fusing accounting and performance metrics with strategic thinking and day-to-day operations. Investors today give non-financial issues a lot of consideration when they attempt to determine the worth of firms. If the economic environment of particular country is unstable, then there is much risk in investment, because it effects on market value of company and investor may suffer loss in future. There are many different ways to measure volatility of stocks, including standard deviations beta coefficients, option pricing etc.

Meaning of Volatility
It is a rate of gain or fall in a security's price for a specific set of returns. The standard deviation of the annualized returns over a specific time period is used to calculate volatility. It displays the potential range in which a security's price may rise or fall.

Importance of study
A stock's volatility has negative implications, and many purchasers and investors look for stocks with higher volatility in order to maximize their returns. A stock with a static price has low volatility but also little chance of making capital gains. Although a stock with a very high level of volatility carries a significant danger of loss, it also has huge potential for profit. Standard deviation, or how far prices deviate from their mean, is a measure of volatility. Standard deviation and volatility go hand in hand. The estimated daily standard deviation is multiplied by an animalization factor based on the time chosen because historical volatility is an annualized figure. The square roots of nevertheless are the animalization factor.

Tools available to check the volatility of equity shares
1. **Standard Deviation**
It is a phrase used in statistics to describe how much variation or dispersion there is around an average. Volatility can also be measured using standard deviation. The discrepancy between the actual value and the average value is known as the dispersion. The standard deviation increases as dispersion or variability increases. The standard deviation decreases with decreasing variability. The standard deviation is a tool used by business analysts to assess projected risk and assess the importance of specific pricing changes. From a financial perspective, the standard deviation can assist investors in determining the minimum required return on the investment and quantifying how hazardous an investment is. The investor might think about include some small-cap stocks or high-yield bonds if he enjoys taking risks, is at ease investing in products with higher risks and higher returns, and can bear a higher standard deviation. Standard deviation of return is used as a risk indicator for investment purposes. The volatility of return for a given asset increases with value, and vice versa.

2. **Annualizing volatility**

Analysts divide the daily standard deviation of the corporation by 252 to get this volatility's annualized form. This presupposes that a given year has 252 trading days. Excel's square root formula is =SQRT ().

By dividing the daily volatility by the square root of 21, we might determine the monthly volatility instead of the annualized volatility. Since there were 21 trade days in a month, we utilize 21.

3. **Beta coefficient**

The beta of a particular stock contributes to its overall market-related instability. A beta is a measure of how volatile a security's profits are overall when compared to relevant benchmark profits (typically the S&P 500 is utilized).

Characteristics of Standard Deviation

A dataset's scattering with regard to its mean, which is calculated as the square root of the change, is estimated by the standard deviation. By determining the variation between each datum's direct correlation to the mean, it is established as the square base of difference.

The bigger the standard deviation, the further away from the mean the information focuses are, and the higher the variation within the informational index.

Standard deviation is a true estimate that, when compared to the annual rate of return of a speculation, provides information about the venture's verifiable instability.

The difference between each price and the mean is more pronounced and indicates a larger value range the higher the security's standard deviation. For instance, the requirement deviation of an unstable stock is higher than that of a stable blue-chip stock, which typically has a lower requirement deviation.

Formula of Standard Deviation:

Where

Ri – The return observed in one period (one observation in the data set)

Ravg – The arithmetic mean of the returns observed

n –Number of observations in the dataset

Interpretation

1.The less volatile and dangerous an investment is, the lower its standard deviation will be.

2. The investment is riskier since returns are more randomly distributed the higher the standard deviation.

Review of Literature

A Study on Stock Market Volatility Pattern of BSE and NSE in India, the authors say that when we analyze the stock market, investors, decision-makers, and researchers pay close attention to the risk assessment. The degree to which the econometric model accurately predicts the behavior of the underlying asset is a key factor in the quality of risk measures. The study looks at volatility clustering, leverage effect, and volatility persistence for the Indian stock markets, National Stock Exchange (NSE) and Bombay Stock Exchange (BSE), for the time span from 1990 to 2016. This study paper's major objective is to investigate the type of volatility present in the Indian stock markets. In this study, the ARCH and GARCH models were used to analyze the volatility of the stock market Tanty, G., & Patjoshi, P. K. (2016).

"Stock Market Volatility-A Study of Indian Stock Exchange" in this article they used four key indices of the Indian stock market, including the SENSEX, and Bombay Stock Exchange's BSE100 and NIFTY and the National Stock Exchange's CNX500. The four indices' daily closing prices are used to calculate the study's time frame. To see the interdependence of Indian stock market with international, Brazil, Russia, India and China are selected as emerging economies and seven developed economies named as USA, UK, Australia, Japan, Germany, Hongkong stock market and Singapore are taken to understand their behavior. The data for Indian stock market is collected from the official websites of National Stock Exchange and Bombay Stock Exchange Sudarsana, D., Rajashekar, & Narayana, R. (2018).

Stock Market Volatility and Return Analysis: A systematic literature review, the four primary areas of inquiry covered in this paper are as follows: first, the monthly return standard deviation, distribution skewness, and other fundamental indicators are examined, highlighting the significance of technical indicators in studying stock price volatility. The appearance of social disturbance events is then discovered to have a favorable effect on stock return volatility. Finally, it is determined that global factors (oil price volatility and the financialization of commodities)

and macroeconomic factors (GDP and industrial productivity) positively correlate with equity price volatility. Bhowmik, R., & Wang, S. (2020).

Dynamics of Stock Market Return Volatility: Evidence from The Daily Data of India and Japan, the authors examined the dynamics of stock market return volatility in India and Japan. The TGARCH-M model is put into practice. Both positive and bad news have an unbalanced effect on these markets. Both nations continue to experience return volatility. The degree of this link varies among nations, but stock returns and volatility do have a substantial positive relationship. The source of stock market volatility is the daily information shocks as well as the variations in investor attitudes and expectations. Market efficiency and liquidity are negatively impacted by a considerable increase in stock market volatility brought on by positive and negative information shocks Mishra, B., & Rahman, M. (2010).

3. Research Gap
Due to a lack of defined norms for estimating procedures, business analysts continue to face estimation issues. A more precise and appropriate tool is required to reduce investment risk.

Research Methodology
Research Type:
This research comes under analytical research type, because it is an analysis of historical value of stock prices of the targeted companies.

Objectives of the study
1. To evaluate volatility of the stock prices of selective companies.
2. To study performance of target company by average returns.
3. To find the relationship between quarterly revenue and stock prices of selected companies.

Hypothesis of the Study
HA_0: There is no significant relationship between average returns and standard deviation of selected companies.
HA_1: There is a significant relationship between average returns and standard deviation of selected companies.
HB_0: There is no significant relationship between quarterly Total revenue and stock prices of selected companies.
HB_1: There is a significant relationship between quarterly Total revenue and stock prices of selected companies.

Sampling Technique
This research comes under Non-Probability sampling type where researcher has used convenience sampling method for selecting a sample.

Determination of Sample Size
Out of the listed automotive companies, here researcher has selected Three companies for the study purpose. i.e. Bajaj Auto Ltd., Tata Motors Ltd. & Maruti Suzuki Ltd.

Data Collection:
Equity closing prices of Bajaj Auto Ltd., Tata Motors Ltd. and Maruti Suzuki India Ltd. are taken from period 1st April 2022 to 16th October 2022 from Bombay Stock Exchange website for calculating Average return, standard deviation and variances of the stocks.

5. Data Analysis
Selected Companies for Study:
1. Bajaj Auto Ltd.,
2. Tata Motors Ltd.
3. Maruti Suzuki India Ltd.

Stock prices performance & Daily Return chart.

Date	Bajaj Auto Ltd.		Tata Motors Ltd.		Maruti Suzuki India Ltd.	
	Close	Daily Return	Close	Daily Return	Close	Daily Return
01-04-2022	3739.900	……….	441.150	……….	7691.85	…………….
04-04-2022	3763.650	0.0064	446.750	0.0127	7775.35	0.0109
05-04-2022	3809.700	0.0122	458.050	0.0253	7760.5	-0.0019
06-04-2022	3801.800	-0.0021	456.150	-0.0041	7744.55	-0.0021

07-04-2022	3802.250	0.0001	449.500	-0.0146	7637.35	-0.0138
08-04-2022	3810.350	0.0021	452.050	0.0057	7557.7	-0.0104
11-04-2022	3787.150	-0.0061	452.050	0.0000	7564.6	0.0009
12-04-2022	3712.050	-0.0198	438.300	-0.0304	7613.55	0.0065
13-04-2022	3697.300	-0.0040	431.050	-0.0165	7471.85	-0.0186
18-04-2022	3714.600	0.0047	433.800	0.0064	7574.55	0.0137
19-04-2022	3657.150	-0.0155	424.950	-0.0204	7438	-0.0180
20-04-2022	3720.750	0.0174	440.550	0.0367	7668.65	0.0310
21-04-2022	3702.350	-0.0049	448.050	0.0170	7875.85	0.0270
22-04-2022	3642.500	-0.0162	438.850	-0.0205	7903.25	0.0035
25-04-2022	3682.950	0.0111	425.150	-0.0312	7910.75	0.0009
26-04-2022	3892.100	0.0568	434.900	0.0229	7901.3	-0.0012
27-04-2022	3905.650	0.0035	430.250	-0.0107	7787.9	-0.0144
28-04-2022	3834.400	-0.0182	436.050	0.0135	7887.95	0.0128
29-04-2022	3729.550	-0.0273	437.600	0.0036	7732.75	-0.0197
02-05-2022	3623.450	-0.0284	432.850	-0.0109	7641.55	-0.0118
04-05-2022	3496.900	-0.0349	423.500	-0.0216	7399.6	-0.0317
05-05-2022	3523.900	0.0077	426.300	0.0066	7405.45	0.0008
06-05-2022	3499.750	-0.0069	408.550	-0.0416	7277.45	-0.0173
09-05-2022	3568.750	0.0197	403.950	-0.0113	7359.5	0.0113
10-05-2022	3593.050	0.0068	391.750	-0.0302	7516.95	0.0214
11-05-2022	3612.850	0.0055	388.150	-0.0092	7389.35	-0.0170
12-05-2022	3585.000	-0.0077	372.300	-0.0408	7252.25	-0.0186
13-05-2022	3642.100	0.0159	404.300	0.0860	7101.8	-0.0207
16-05-2022	3715.850	0.0202	405.350	0.0026	7253.9	0.0214
17-05-2022	3742.900	0.0073	424.150	0.0464	7533.45	0.0385
18-05-2022	3791.200	0.0129	415.150	-0.0212	7565.9	0.0043
19-05-2022	3698.550	-0.0244	398.650	-0.0397	7409.05	-0.0207
20-05-2022	3787.800	0.0241	418.000	0.0485	7587.2	0.0240
23-05-2022	3786.150	-0.0004	421.450	0.0083	7896.2	0.0407
24-05-2022	3783.300	-0.0008	425.750	0.0102	7799.7	-0.0122
25-05-2022	3791.800	0.0022	417.000	-0.0206	7785.8	-0.0018
26-05-2022	3857.350	0.0173	420.650	0.0088	7806.4	0.0026
27-05-2022	3833.050	-0.0063	429.600	0.0213	7941.6	0.0173
30-05-2022	3856.700	0.0062	442.400	0.0298	8013.6	0.0091
31-05-2022	3864.100	0.0019	443.550	0.0026	7970.25	-0.0054
01-06-2022	3720.100	-0.0373	444.600	0.0024	7937.6	-0.0041
02-06-2022	3688.700	-0.0084	439.150	-0.0123	7924.75	-0.0016
03-06-2022	3672.700	-0.0043	431.900	-0.0165	7707.05	-0.0275
06-06-2022	3817.000	0.0393	432.350	0.0010	7710.65	0.0005
07-06-2022	3834.100	0.0045	435.850	0.0081	7808.65	0.0127
08-06-2022	3794.150	-0.0104	435.650	-0.0005	7893.1	0.0108
09-06-2022	3878.650	0.0223	428.500	-0.0164	7925.55	0.0041
10-06-2022	3881.000	0.0006	428.050	-0.0011	7934.8	0.0012
13-06-2022	3881.250	0.0001	406.700	-0.0499	7896.25	-0.0049
14-06-2022	3681.750	-0.0514	405.150	-0.0038	7810.75	-0.0108
15-06-2022	3698.100	0.0044	414.100	0.0221	7852.75	0.0054
16-06-2022	3658.200	-0.0108	392.950	-0.0511	7833.15	-0.0025
17-06-2022	3628.950	-0.0080	388.950	-0.0102	7690.95	-0.0182
20-06-2022	3615.950	-0.0036	382.700	-0.0161	7659.85	-0.0040
21-06-2022	3645.250	0.0081	397.600	0.0389	7780.85	0.0158
22-06-2022	3635.650	-0.0026	393.100	-0.0113	7782	0.0001

23-06-2022	3784.800	0.0410	407.200	0.0359	8274.6	0.0633
24-06-2022	3813.350	0.0075	409.300	0.0052	8355.2	0.0097
27-06-2022	3861.200	0.0125	414.500	0.0127	8443.85	0.0106
28-06-2022	3889.000	0.0072	417.100	0.0063	8487.9	0.0052
29-06-2022	3867.550	-0.0055	416.950	-0.0004	8507.5	0.0023
30-06-2022	3706.600	-0.0416	411.800	-0.0124	8470.2	-0.0044
01-07-2022	3624.600	-0.0221	412.700	0.0022	8396.6	-0.0087
04-07-2022	3679.750	0.0152	408.450	-0.0103	8440.25	0.0052
05-07-2022	3682.750	0.0008	412.000	0.0087	8344.8	-0.0113
06-07-2022	3773.050	0.0245	416.350	0.0106	8634.9	0.0348
07-07-2022	3795.500	0.0060	430.850	0.0348	8598.65	-0.0042
08-07-2022	3825.000	0.0078	441.550	0.0248	8475.45	-0.0143
11-07-2022	3848.550	0.0062	437.050	-0.0102	8504.55	0.0034
12-07-2022	3847.850	-0.0002	430.550	-0.0149	8422.1	-0.0097
13-07-2022	3860.750	0.0034	427.100	-0.0080	8440.25	0.0022
14-07-2022	3863.200	0.0006	428.050	0.0022	8562.25	0.0145
15-07-2022	3913.350	0.0130	440.200	0.0284	8780.75	0.0255
18-07-2022	3984.050	0.0181	450.900	0.0243	8707.05	-0.0084
19-07-2022	4002.000	0.0045	449.050	-0.0041	8714.6	0.0009
20-07-2022	4002.050	0.0000	453.450	0.0098	8745.4	0.0035
21-07-2022	4057.050	0.0137	454.850	0.0031	8801.2	0.0064
22-07-2022	4054.500	-0.0006	454.900	0.0001	8826.05	0.0028
25-07-2022	4021.150	-0.0082	449.550	-0.0118	8613.3	-0.0241
26-07-2022	3925.600	-0.0238	441.150	-0.0187	8522.05	-0.0106
27-07-2022	3883.850	-0.0106	444.050	0.0066	8660.05	0.0162
28-07-2022	3858.250	-0.0066	442.250	-0.0041	8720.3	0.0070
29-07-2022	3914.450	0.0146	449.600	0.0166	8772.45	0.0060
01-08-2022	3973.300	0.0150	479.200	0.0658	9004	0.0264
02-08-2022	3996.200	0.0058	476.250	-0.0062	9167	0.0181
03-08-2022	4003.450	0.0018	467.800	-0.0177	8956.7	-0.0229
04-08-2022	4011.700	0.0021	468.900	0.0024	8970.95	0.0016
05-08-2022	4013.100	0.0003	465.250	-0.0078	8836.05	-0.0150
08-08-2022	4022.650	0.0024	468.250	0.0064	8923.55	0.0099
10-08-2022	4034.850	0.0030	475.550	0.0156	8879.45	-0.0049
11-08-2022	4033.500	-0.0003	476.650	0.0023	8818	-0.0069
12-08-2022	4038.000	0.0011	477.550	0.0019	8699.15	-0.0135
16-08-2022	4091.150	0.0132	489.850	0.0258	8999.45	0.0345
17-08-2022	4067.900	-0.0057	485.400	-0.0091	8947.4	-0.0058
18-08-2022	4060.650	-0.0018	484.800	-0.0012	8939.3	-0.0009
19-08-2022	4074.550	0.0034	471.000	-0.0285	8777.5	-0.0181
22-08-2022	4041.600	-0.0081	454.600	-0.0348	8623.5	-0.0175
23-08-2022	4064.450	0.0057	460.450	0.0129	8721.8	0.0114
24-08-2022	4065.750	0.0003	463.200	0.0060	8691.8	-0.0034
25-08-2022	4062.950	-0.0007	459.200	-0.0086	8732.2	0.0046
26-08-2022	4054.400	-0.0021	465.050	0.0127	8719.2	-0.0015
29-08-2022	4030.050	-0.0060	453.350	-0.0252	8832.75	0.0130
30-08-2022	4084.850	0.0136	471.100	0.0392	9091.9	0.0293
01-09-2022	4076.300	-0.0021	466.900	-0.0089	9027.95	-0.0070
02-09-2022	4030.900	-0.0111	461.750	-0.0110	8920.1	-0.0119
05-09-2022	3956.650	-0.0184	459.000	-0.0060	8938.9	0.0021
06-09-2022	3929.400	-0.0069	457.750	-0.0027	8883.9	-0.0062
07-09-2022	3845.650	-0.0213	445.850	-0.0260	8782.1	-0.0115

08-09-2022	3846.600	0.0002	442.200	-0.0082	8787.65	0.0006
09-09-2022	3848.600	0.0005	445.900	0.0084	8945.7	0.0180
12-09-2022	3870.300	0.0056	451.000	0.0114	8928	-0.0020
13-09-2022	3866.500	-0.0010	456.800	0.0129	8926.2	-0.0002
14-09-2022	3850.250	-0.0042	450.200	-0.0144	8956	0.0033
15-09-2022	3768.000	-0.0214	447.250	-0.0066	9245.2	0.0323
16-09-2022	3689.550	-0.0208	432.500	-0.0330	9225.6	-0.0021
19-09-2022	3708.250	0.0051	425.450	-0.0163	9283.35	0.0063
20-09-2022	3768.600	0.0163	434.250	0.0207	9296.9	0.0015
21-09-2022	3730.600	-0.0101	427.650	-0.0152	9248.7	-0.0052
22-09-2022	3728.900	-0.0005	432.200	0.0106	9403.85	0.0168
23-09-2022	3698.900	-0.0080	423.100	-0.0211	9343.9	-0.0064
26-09-2022	3574.500	-0.0336	397.500	-0.0605	8830.6	-0.0549
27-09-2022	3541.900	-0.0091	398.800	0.0033	8772.65	-0.0066
28-09-2022	3545.900	0.0011	399.100	0.0008	8716.2	-0.0064
29-09-2022	3476.700	-0.0195	402.250	0.0079	8620.95	-0.0109
30-09-2022	3527.750	0.0147	404.600	0.0058	8823.55	0.0235
03-10-2022	3515.350	-0.0035	397.650	-0.0172	8544.4	-0.0316
04-10-2022	3579.600	0.0183	407.900	0.0258	8687.45	0.0167
06-10-2022	3594.650	0.0042	414.100	0.0152	8702.25	0.0017
07-10-2022	3603.550	0.0025	412.150	-0.0047	8782.95	0.0093
10-10-2022	3616.950	0.0037	395.950	-0.0393	8865.55	0.0094
11-10-2022	3528.750	-0.0244	393.350	-0.0066	8681.95	-0.0207
12-10-2022	3624.500	0.0271	396.550	0.0081	8685.85	0.0004
13-10-2022	3604.800	-0.0054	399.000	0.0062	8645	-0.0047
14-10-2022	3570.500	-0.0095	396.250	-0.0069	8617.3	-0.0032
	Average Return	-0.0026	Average Return	-0.0058	Average Return	-0.0034
	Standard Deviation	0.0147	Standard Deviation	0.0199	Standard Deviation	0.0180
	Variance	0.0002	Variance	0.0004	Variance	0.0003

Table 1: Average return, daily return, standard deviation and variance analysis.

Interpretation

A security is considered to have high volatility if its prices change significantly over a short period of time. A security is said to have low volatility if its price changes gradually over time.

Above table represents that, Standard deviation in stock prices of Bajaj Auto Ltd. is 0.00147 which is less than the standard deviation of Tata Motors Ltd. and Maruti Suzuki Ltd. It shows that Stock prices of all companies are more stable. Out of the three companies stock, stock of Bajaj Auto Ltd. is more stable that rest of the two companies, so investor should prefer to purchase a stock of Bajaj Auto Ltd. due to low volatility. The proportion in which standard deviation increases, it increases the variances of stock, due to low vitality variance is low, it shows stability of share prices. Variance of Baja Auto Ltd. is low as compared to rest of the companies so investor should put first preference to invest in it.

Average daily return is showing negative sign on the data of six months, it shows overall economic inflation affected of stock prices, now investors are preferring stocks of Information technology & health and hospitality industries. Average daily returns of previous six months of selected companies show negative sign it, indicates the sign of inflation of market.

Quarter wise Revenue, Gross Profit ratio, Net Profit Ratio, and Closing stock prices of the companies
Table 2: Quarter wise Revenue, Gross Profit ratio, Net Profit Ratio, and Closing stock prices

Particular	Bajaj Auto Ltd. (Amt. in Thousand)			Tata Motors Ltd. (Amt. in Crores)			Maruti Suzuki India Ltd. (Amt. in Thousand)		
	30-Dec-21	30-Mar-22	29-Jun-22	30-Dec-21	30-Mar-22	29-Jun-22	30-Dec-21	30-Mar-22	29-Jun-22
Total Revenue	88,055,000	78,269,400	77,688,900	6,576.61	17,338.27	14,874.44	221,862,000	268,822,000	222,889,000
Gross Profit	20,664,400	14,188,800	19,962,800	-915.73	312.54	-138.25	47,093,000	37,160,000	55,471,000
Net Profit for Equities	14,296,800	15,261,600	11,633,300	-941.42	413.35	-181.03	10,418,000	18,758,000	10,362,000
Gross profit ratio	23.47	18.13	25.70	-13.92	1.80	-0.93	21.23	13.82	24.89
Net profit ratio	16.24	19.50	14.97	-14.31	2.38	-1.22	4.70	6.98	4.65
Stock Price at every Quarter	3200.8	3676.1	3867.55	476.0	433.7	416.95	7344.6	7437.9	7207.5

Interpretation
1. The above table shows that Total revenue of Bajaj Auto Ltd. was decreased in the second and third quarter, but the gross profit ratio of the company was 23.47% in first quarter, it decreased to 18.13% in second quarter and again increased to 25.70% in third quarter. In third quarter though there is decrease in revenue but gross profit ratio is increased, it shows that company has controlled the factory expenses. The closing stock prices of every quarter is shows increasing trend, it shows purchasing the shares of Bajaj auto ltd may give good returns to the investors.
2. Total revenue of Tata Motors Ltd. was increased in the second quarter, but again decreased in third quarter but the gross profit ratio of the company was negative in first quarter, it became positive in second quarter and again became negative in third quarter. Due to decrease in net profit, gross profit and net profit, company's quarterly stock price shows decreasing trend.
3. Total revenue of Maruti Suzuki India Ltd. was increased in the second quarter, but again decreased in third quarter, the gross profit ratio of the company was decreased in second quarter, it again increased in third quarter. Stock price of the second quarter is increased in second and third quarter.
   After the careful analysis of quarter wise revenue and stock price of selected companies, it proves that there is positive relationship between quarter wise revenue and stock price of respective companies which accepts alternative hypothesis HB_1.

6. Findings
1. Equity share price performance of Baja Auto Ltd. is very good, there is no risk in investment in this company.
2. Due to less volatility of share prices, daily returns are also less volatile because of lowest growth rate.
3. Since post COVID 19 this sector growing slowly, it will take another half year to boost. Investors may hold these stocks long term purpose.
4. There is a positive relationship between quarter wise revenue and stock price of respective companies. So while investing in the companies, investor should check revenue and quarterly stock prices.

7. Limitations of Study:
Here researcher has taken a data of six months and calculated standard deviation, variance and average returns to check the volatility of company's stock. Investors/ analyst can calculate standard deviation for 252 stock working days, which will show a clearer picture of the company before investment.

Volatility does not reflect how prices move in relation to one another. This is so that both positive and negative differences are merged into one quantity when standard deviation (or variance) is calculated.

8. Conclusion

In trading and investment methods, the standard deviation is a particularly helpful tool since it can be used to gauge stock volatility and forecast performance trends. Volatility gauges a security's risk. It provides information on the security's pricing pattern and aids in estimating potential short-term swings.

Increase in revenue increases the stock price of the companies, those companies whose revenue, net profit and gross profit and stock price shows increasing trend such company is good for investment.

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