

**A Comparative Study of Effectiveness of
Online and Offline Learning System in Control
of Higher Education in South-East Rajasthan**

A

Summary of the Thesis

Submitted

for award of the degree of

DOCTOR OF PHILOSOPHY

BY

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**CAREER POINT
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School of Commerce and Management

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CERTIFICATE BY SUPERVISOR

It gives me immense pleasure in certifying that the thesis entitled “**A Comparative Study of Effectiveness of Online and Offline Learning System in Control of Higher Education in South-East Rajasthan**” and submitted by Kavita Jain is based on the work research carried out under my guidance.

Certified that this is the bonafide work of the scholar she had carried out the research under my supervision and devoid of any plagiarism. It is further certified that from the best of my knowledge, the work reported herein never remained part of any other thesis or dissertation.

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- (1) Course work as per the university rules.
- (2) Residential requirement of the university.
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I recommend the submission of thesis and certify that it is fit to be evaluated by the examiners.

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DECLARATION

I **Kavita Jain** D/o Sh. Chandmal Jain resident of Kota, hereby declare that the research work incorporated in the present thesis entitled; **“A Comparative Study of Effectiveness of Online and Offline Learning System in Control of Higher Education in South-East Rajasthan”** is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of a Degree or a Diploma. I have properly acknowledged the material collected from secondary sources wherever required. I solely own the responsibility for the originality of the entire content.

Date:

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Summary

1 .Introduction

India's dense population makes it especially susceptible to infectious diseases like COVID-19, highlighting the continued relevance of online education as a safer and more practical alternative even after widespread vaccination. The pandemic-triggered shift to digital learning ensured educational continuity but also exposed deep-rooted inequalities, particularly affecting marginalized communities such as Scheduled Castes, Scheduled Tribes, women, the elderly, and sexual minorities who struggled with limited access to devices and internet connectivity. While online learning had already been gaining ground due to its flexibility and cost-effectiveness—especially following the UGC's 2018 endorsement—COVID-19 significantly accelerated its adoption. Despite its advantages, online education also underscores the digital divide, with many students lacking the infrastructure or supportive environments needed for effective learning. Additionally, concerns such as health issues, mental stress, and reduced social interaction persist. For online education to succeed in India, it is crucial to address these disparities through infrastructural improvements, educator training, and the development of inclusive, accessible content that supports all learners.

Offline Learning in Higher Education

Offline learning in higher education continues to play a critical role by offering structured, face-to-face interactions that promote immersive academic engagement. In traditional classrooms, students benefit from direct communication with instructors and peers, fostering collaborative learning and intellectual discourse. The physical environment minimizes distractions and supports disciplined study routines, while smaller teacher-to-student ratios in specialized sessions allow for tailored feedback and personalized academic guidance. Despite technological advancements, offline learning maintains its effectiveness by providing real-time supervision, immediate doubt resolution, and a strong sense of

academic community. These factors collectively support deeper cognitive retention, critical thinking, and a more disciplined approach to education—especially crucial in fields requiring hands-on training and conceptual clarity.

Online learning in higher education has revolutionized academic delivery by enabling flexible, personalized, and globally connected education. Through digital platforms and cloud-based systems, students can access a vast array of resources anytime, anywhere—transcending geographical limitations. This mode promotes self-paced learning, independent inquiry, and adaptive learning paths based on individual strengths and preferences. The integration of multimedia tools, interactive assessments, and real-time tracking fosters active engagement and supports diverse cognitive styles. Moreover, online education empowers both educators and learners to collaborate dynamically while incorporating data-driven feedback for continuous improvement. As the higher education landscape evolves, online learning emerges as a vital complement to traditional methods, aligning academic outcomes with the demands of a digital, knowledge-based economy.

2. Review of Literature

The reviewed literature highlights a growing interest in the comparative analysis. E-learning has emerged as a transformative mode of education over the past two decades, especially gaining momentum during and after the COVID-19 pandemic. Numerous studies have critically examined its advantages, limitations, and comparative effectiveness with traditional classroom-based learning.

Katoua, Taghreed, Al-Lozi, and Alrowwad (2016) critically reviewed the literature on e-learning systems, emphasizing the role of student variables such as behaviors, attitudes, cultural background, and demographics in influencing online learning outcomes. Their comparative study of students in Lebanon and England revealed that understanding learners' characteristics aids educators in designing more effective, collaborative e-learning environments. Similarly, Wong and Ng (2016)

conducted an empirical study among electronics engineering students and found that students using e-learning platforms showed better academic performance and higher satisfaction compared to traditional learners, highlighting the flexibility and effectiveness of digital platforms.

Alsaaty et al. (2016) focused on the perceptions of minority students in higher education and suggested that hybrid or blended learning models may be more effective than strictly online or offline methods. Meanwhile, Sun and Chen (2016) reviewed the historical development of online education, predicting its continued evolution and integration into mainstream higher education, though unlikely to replace traditional modes entirely.

Several Indian researchers have explored e-learning within the context of India's socio-economic and infrastructural limitations. Lone (2017) and Sharma & Jain (2018) emphasized the challenges posed by inadequate infrastructure, especially in rural areas. Joshi and Dewangan (2021) recognized e-learning's potential as a societal equalizer but stressed the need for government support, infrastructure development, and increased awareness to bridge the digital divide. Similarly, Jindal and Chahal (2020) advocated for stronger collaboration between government, industry, and academia to enhance the effectiveness of e-learning.

A number of studies during the COVID-19 pandemic, such as those by Sharma & Singh (2020), Goswami et al. (2021), and Kundu & Kundu (2022), highlighted how the sudden transition to online learning exposed serious infrastructural and social inequalities. These studies indicated that students from marginalized communities—particularly Scheduled Castes, Scheduled Tribes, and rural regions—faced severe challenges due to poor internet connectivity, lack of digital devices, and unfamiliarity with digital platforms.

Moreover, studies like those by Koay et al. (2021) and Kumari et al. (2021) found that while online learning provided temporal flexibility and content access, it

failed to replicate the depth of face-to-face interaction, especially in skill-intensive fields like medicine. This was further supported by Naik et al. (2021) who found that over 60% of students in India were not prepared for online classes, especially for practical and technical subjects.

While online education has shown promise, researchers like Deevi (2021) and Kundu & Kundu (2022) caution that in countries like India, with significant socio-economic and cultural diversity, a fully online system may not be suitable. Instead, they recommend the blended learning model—combining offline and online modes—as a feasible future direction. However, this too requires infrastructural upgrades and increased digital literacy.

3. Research Gap

Despite the comprehensive global and national literature on e-learning, several gaps remain, particularly relevant to the context of **South-East Rajasthan**: After the extensive review of literature, it has been found that the e-learning has a positive impact on the student learning but there are various challenges faced by the students due to lack of infrastructure facilities. The e-learning and classroom learning has been adopted in academics after covid-19 but it was not proved as effective as it was expected in India as we are lacking infrastructural facilities for it. So there are many issues and problems in South-East Rajasthan that need to be studied to understand the problems and effectiveness of e-learning.

4. Objectives and Hypothesis of the Research

The objective of the research are given as follows:

1. To study the meaning, concept, techniques and benefits of online and offline learning.
2. To critically review the development of online learning environment.
3. To study the growth, problems and prospects of online learning.

4. To compare the online and offline teaching methods and its effectiveness in higher education system in India.
5. To study the impact of online learning on the students on the basis of various demographic factors such as gender, region etc.

5. Hypothesis of the Research

First Hypothesis

H0: There is no significant difference between the effectiveness of online and offline education provided by higher educational institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online and offline education provided by higher educational institutes in south-east Rajasthan.

Second Hypothesis

H0: There is no significant difference between opinion of male and female students on the effectiveness of the online education.

H1: There is significant difference between opinion of male and female students on the effectiveness of the online education.

Third Hypothesis

H0: There is no significant difference between the opinion of students about online education residing in rural and urban areas in south-east Rajasthan.

H1: There is significant difference between the opinion of students about online education residing in rural and urban areas in south-east Rajasthan.

Fourth Hypothesis

H0: There is no significant difference between the effectiveness of online education provided by private and government institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online education provided by private and government institutes in south-east Rajasthan.

Fifth Hypothesis

H0: There is no significant difference between the effectiveness of online education provided by technical and non-technical institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online education provided by technical and non-technical institutes in south-east Rajasthan.

6. Research Methodology

The survey reveals a strong preference for offline learning, with many students favoring it for better audio-visual clarity, understanding, teacher interaction, and concentration. While online tools like Zoom, Google Classroom, and YouTube are widely used, their effectiveness is sometimes limited due to uneven access to recorded lectures and digital infrastructure issues.

Students show high digital literacy, but device affordability (75.26%) and poor internet connectivity (43.88%) remain major challenges. Blackboard and LED projectors are commonly used, indicating a shift toward modern tech, while traditional tools like overhead projectors are in decline.

Infrastructure feedback is mixed—ventilation (75.26%) and seating (49.51%) need improvement, while painting and overall convenience are mostly rated positively. Time management issues, such as institutional delays (71.75%), are significant, though between-class gaps received more varied responses.

Students largely report minimal classroom disturbances, and external distractions (49.38%) are a concern for some. There's a notable concern about lack of

flexibility (72.26%) and inconsistent class continuity, highlighting the need for more adaptive academic models.

In online settings, many face audio (61.51%) and visual (42.26%) issues, which hinder learning. Most students prefer laptops/desktops for online classes over mobile devices due to better usability.

There's also a strong preference for offline learning in practical/lab-based courses, while theory and numericals show more openness to online formats. Seasonal preferences indicate a shift toward offline learning in summer and online during winter, with consistent support for flexible, blended learning models.

Research Type: The present study is descriptive in nature. This was an empirical study in which the data is collected and described to find the effectiveness of the e-learning system in South-East Rajasthan.

Research Area (Location): South-East Rajasthan includes the major cities like Kota, Bundi, Barah and Jhalawar. There are total 5 universities in South-East Rajasthan namely Rajasthan Technical University, University of Kota, Vardhaman Mahaveer Open University, Career Point University and Jai Meenesh Adiwas University. There are many government and non-government institutes are located in the selected region affiliated to the Rajasthan Technical University and University of Kota. Both the universities offers regular undergraduate, postgraduate and doctoral programs. Career Point University and Jai Meenesh Adiwas University are the private university. Agriculture University is also a government university which offers the undergraduate programs in agriculture stream. The name of the prominent institutes located in this region are

Population: There are more than 100,000 lakh students studying in South-East Rajasthan. Most of the students are studying in regular degree courses institutes. So sampling method is used.

Sampling Method: Simple Random Sampling is used to collect the student response about e-learning system.

Sample Size: Sample Size Calculation: At the 95% confidence level using the (Slovin's Formula: $N/(1+N(e)^2)$ at 5% MOE the sample size should be more than 380 number of customers. *Source: <https://www.pollfish.com/margin-of-error-calculator>

The total of **800 students** was selected for their opinion/experience about e-learning.

Data Collection Method

Primary Method: As this is an empirical study to find the impact of e-learning, the primary method of data collection has been used. The well-structured questionnaire was formulated to collect the data from the students.

Secondary Method: The secondary data was collected from articles, research works, newspaper, books and websites. It was helpful to understand the e-learning concepts, merits, demerits and present scenario in South-East Rajasthan.

Pilot study

Before conducting the study, the items of the questionnaire have been tested to avoid ambiguity and to check validity and reliability. This has been done through a pilot study conducted before the actual data collection. Chronbach Alpha Method was applied for validity and reliability testing of the questionnaire.

Questionnaire Validation and Reliability

Validity of Questionnaire

The content validity of the questionnaire was checked after the completion of the first draft. The questionnaire was forwarded to experts in the field, whose opinions

were noted, and the proposed necessary changes were updated in the questionnaire. The suggested changes included the order of the questions, the language of the questions, and the removal of some unnecessary questions. After all the changes were made, the questionnaire was finalized for data collection. test for performed on the data from the questionnaire for testing reliability and validity. The validity & reliability of the questionnaire was checked using the Chronback Alpha test. The results are shown below:

Table No. 1 Chronback's Alpha

K	Sum of Variance	Total Variance
40	63.52381	498.3983
	1.025641	0.872544
Chronback's Alpha	0.894917	(ACCEPTABLE)

Table No. 2 Internal Consistency

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Interpretation: The Cronbach's Alpha value is 0.89, which falls in the range of 0.8 to 0.9. This indicates that the questionnaire has good internal consistency.

Validity Test: Exploratory Factor Analysis (EFA) on Factors of Online and Offline Education

Performing Exploratory Factor Analysis (EFA) on the factors of online and offline education involves several steps, from preparing your data to interpreting the results. Here's a comprehensive guide to help you through this process, including a practical example and detailed instructions for using various tools like SPSS, R, and Python.

For online education, you might be interested in factors such as:

- **Student Engagement**
- **Course Quality**
- **Instructor Effectiveness**
- **Technology Usability**
- **Learning Outcomes**

KMO Measure: 0.78 (Acceptable). **Bartlett's Test:** Significant ($p < 0.001$)

Interpretation: The EFA value is .78 show it is in acceptable. Hence, the questionnaire passed the validity test.

7. Importance of the Research

Conclusion was drawn on the basis of the data collected using questionnaire about the effectiveness and problems of the e-learning system in south-east Rajasthan. In any research study, the **objectives** and **hypotheses** play a crucial role in defining the direction, scope, and analytical framework of the investigation. They form the foundation on which the study is designed, conducted, and evaluated. Below is an explanation of the importance of both elements in the context of your research on **online and offline learning in higher education in south-east Rajasthan**.

8. Limitation Due to specified time period of the research the sampling method was used for collecting the data. Therefore, this research may be inherited with the limitations of the sampling method and the bias behavior of the respondents.

The research is limited to a specific area i.e south-east Rajasthan and few number of students were interviewed. Therefore, the conclusion can be affected by student's bias behaviour.

9. Scope of the Study

This study was helpful to the students to understand the challenges in the e-learning system for the students and further study to enhance the overall the significance of the e-learning. The educational institutes can adopt the ICT techniques to enhance the overall effectiveness of the overall technological based solutions. This study will also help the government to create the infrastructure facilities and to design curriculum to make e-learning system more effective.

10. Data Analysis

Student view/suggestions about online and offline teaching methods

Table No. 3: Method want to be used for delivering the lectures

Method want to be used for delivering the lectures	Respondent	Percentage
Online only	351	43.88
Both online and offline	247	30.88
Only Offline	202	25.25
Total	800	100

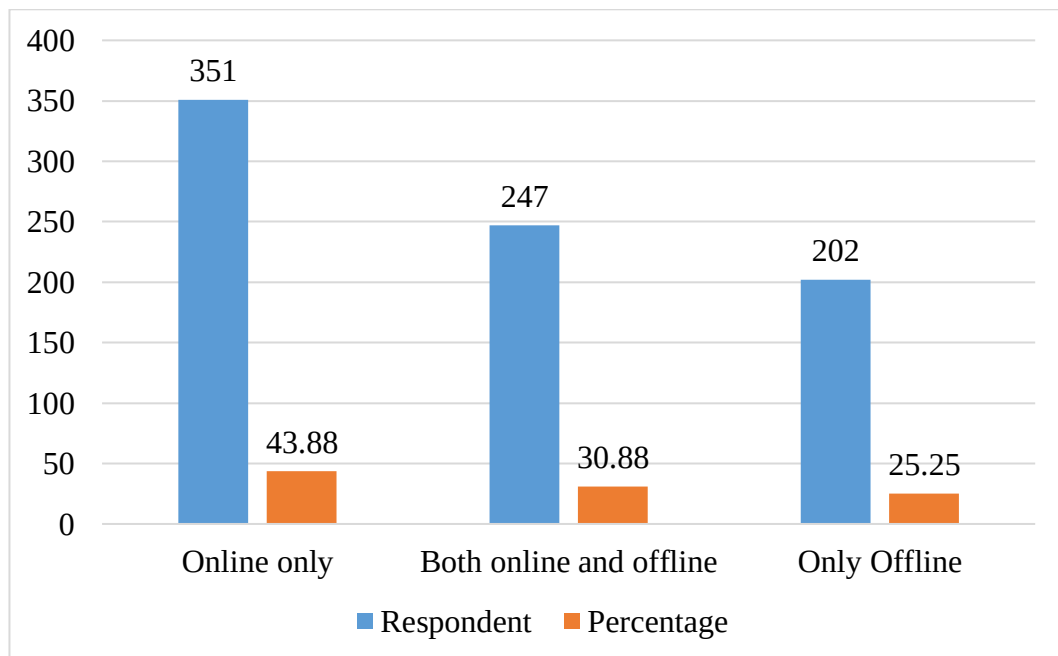


Figure No. 1: Which method you want to be used for delivering the lectures

Interpretation: As shown in the figure above, respondents were asked about their preference for the method of delivering lectures. The results indicate that 43.88% (351 respondents) prefer lectures to be delivered online only. A significant portion,

30.88% (247 respondents), prefers lectures to be delivered both online and offline. Meanwhile, 25.25% (202 respondents) prefer lectures to be delivered only offline.

Desired mode of classes to be conducted for different types of subjects

(a) Theory Based Lectures

Table No. 4: Theory Based Lectures

Theory Based Lectures	Respondent	Percentage
Online only	247	30.88
Offline only	378	47.25
Any of Online or Offline	175	21.88
Total	800	100

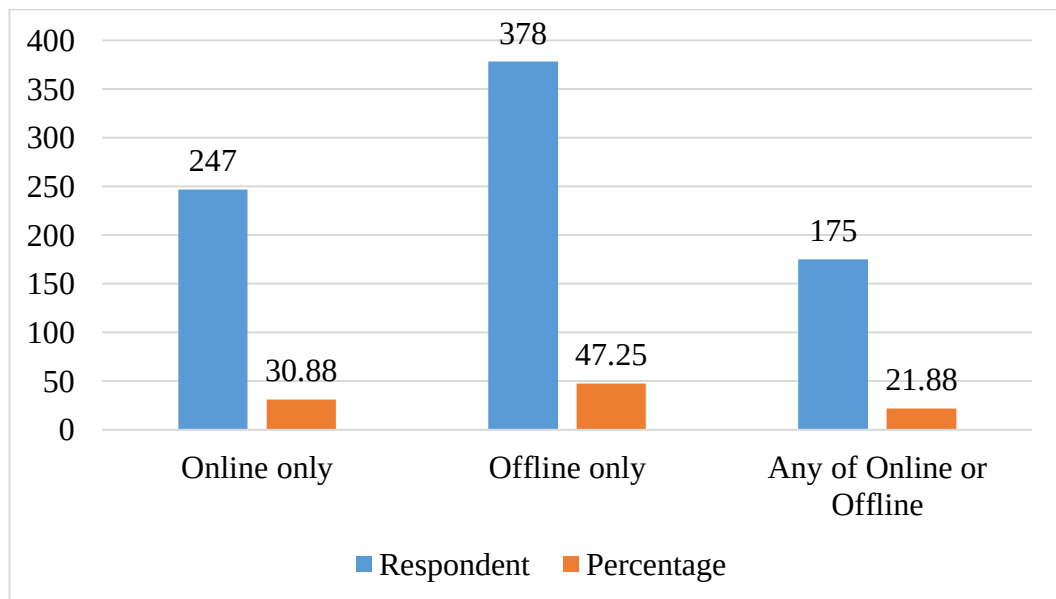


Figure No. 2: Theory Based Lectures

Interpretation: As shown in the figure above, respondents were queried about their preferences regarding theory-based lectures. The results indicate that 30.88%

(247 respondents) favour theory-based lectures delivered exclusively online. In contrast, a larger proportion, comprising 47.25% (378 respondents), prefers these lectures in an offline format. Additionally, 21.88% (175 respondents) expressed a preference for theory-based lectures in either online or offline formats, illustrating a preference for flexibility in how they receive such content.

(b) Numerical Based Lectures

Table No. 5: Numerical Based Lectures

Numerical Based Lectures	Respondent	Percentage
Online only	147	18.38
Offline only	549	68.63
Any of Online or Offline	104	13
Total	800	100

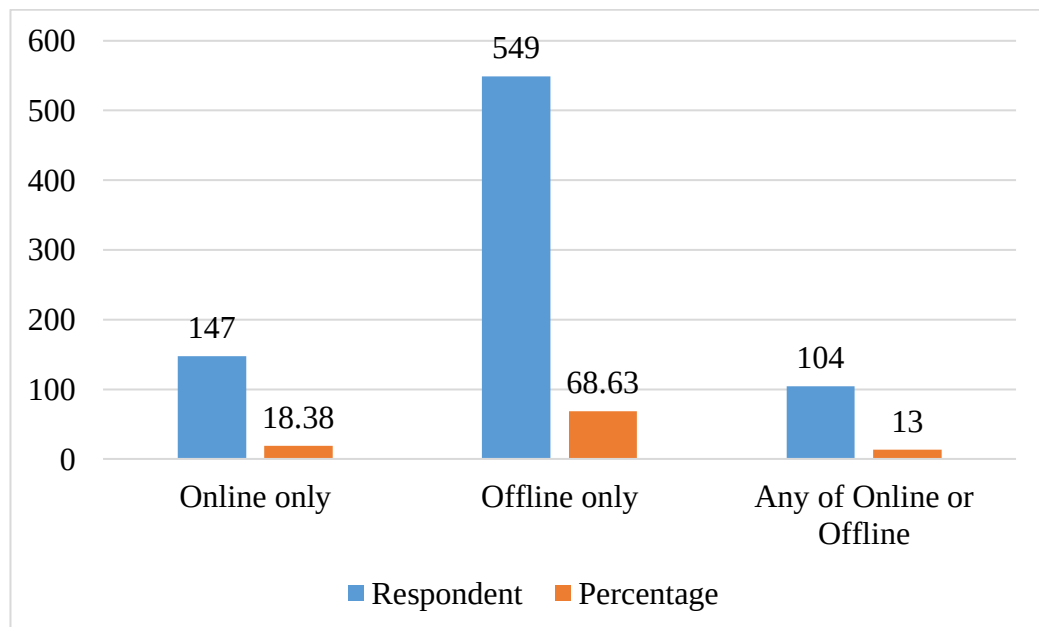


Figure No. 3: Numerical Based Lectures

Interpretation: As indicated by the data above, respondents were surveyed regarding their preferences for numerical-based lectures. The findings reveal that 18.38% (147 respondents) favor numerical-based lectures delivered exclusively online. In contrast, a significant majority, accounting for 68.63% (549 respondents), prefers these lectures in an offline format. A smaller portion, constituting 13% (104 respondents), expressed a preference for numerical-based lectures in either online or offline formats, reflecting a desire for flexibility in how they engage with numerical content.

(c) Practical/Lab based Lectures

Table No. 6: Practical/Lab based Lectures

Practical/Lab based Lectures	Respondent	Percentage
Online only	376	47
Offline only	82	10.25
Any of Online or Offline	342	42.75
Total	800	100

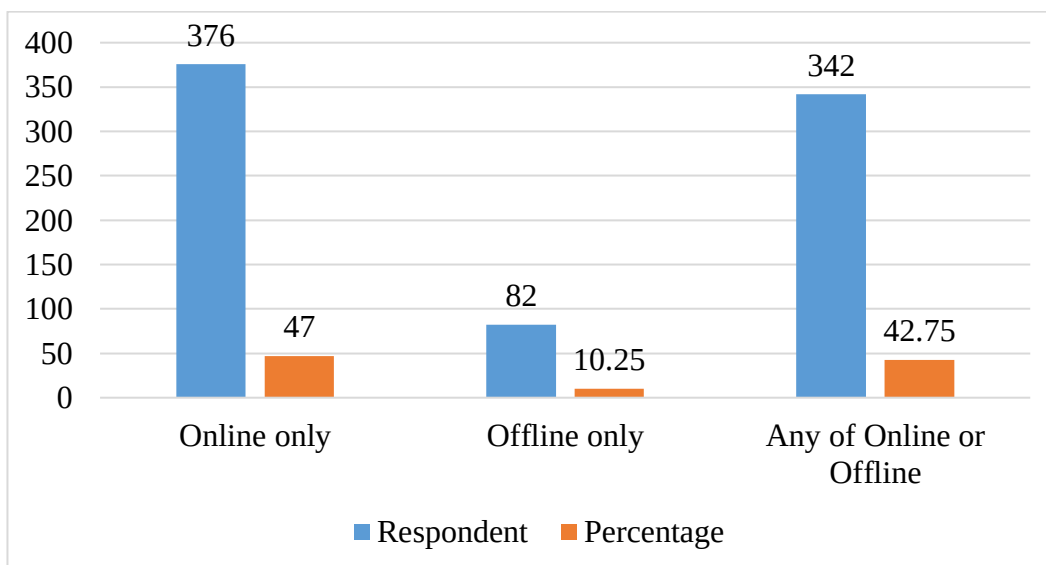


Figure No. 4: Practical/Lab based Lectures

Interpretation: As shown in the figure above, respondents were asked about their preferred method for practical or lab-based lectures. The results show that 47% (376 respondents) prefer these lectures to be conducted exclusively online. In contrast, a smaller percentage, 10.25% (82 respondents), prefer offline-only delivery. A substantial portion, comprising 42.75% (342 respondents), indicated a preference for practical or lab-based lectures to be available in either online or offline formats, suggesting a desire for flexibility in accessing these types of educational sessions.

Table No. 7: Method Preferred to be used for delivering the lectures

Method preferred to be used for delivering the lectures in	Respondent	Percentage
Online only for all seasons	206	25.75
Both online and offline depends on the weather condition	456	57
Only Offline for all seasons	138	17.25

Total	800	100
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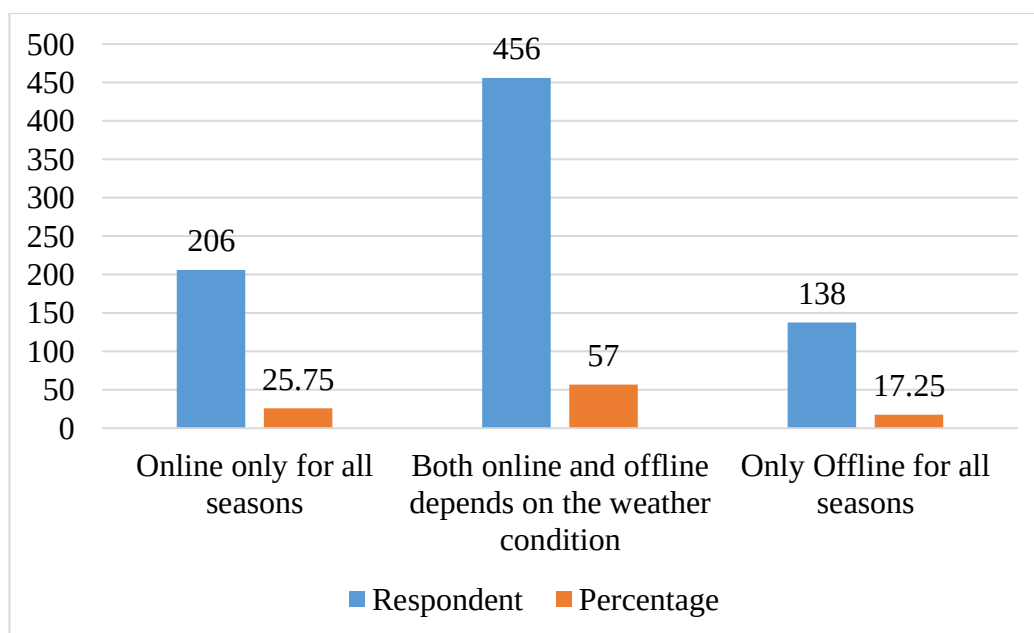


Figure No. 5: Which method you want to be used for delivering the lectures

Interpretation: As shown in the figure above, respondents were asked about their preferred method for delivering lectures based on different conditions. The results indicate that 25.75% (206 respondents) prefer lectures to be delivered exclusively online for all seasons. A majority, comprising 57% (456 respondents), prefer a flexible approach where lectures are delivered both online and offline, depending on weather conditions or other factors. On the other hand, 17.25% (138 respondents) prefer lectures to be delivered only offline for all seasons.

Mode preferred for classes to be conducted in different seasons

(a) Summer

Table No. 8: Summer

Summer	Respondent	Percentage
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Online only	286	35.75
Offline only	391	48.88
Any of Online or Offline	123	15.38
Total	800	100

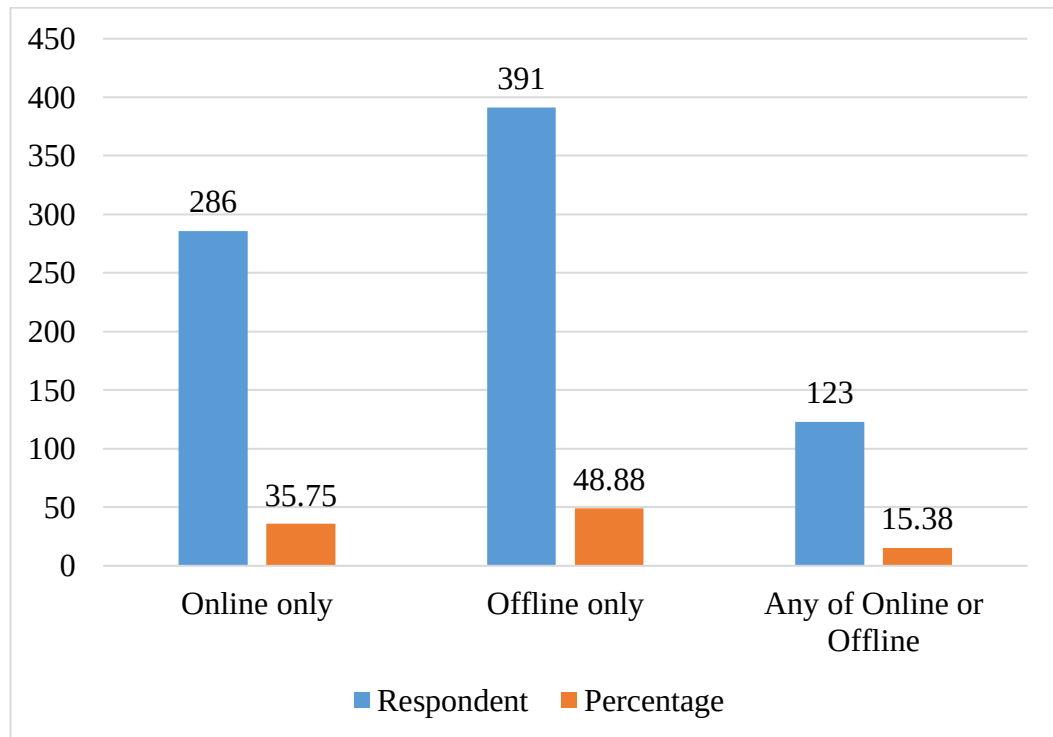


Figure No. 6: Summer

Interpretation: As shown in the figure above, respondents were asked about their preferred mode of learning during the summer season. The results indicate that 35.75% (286 respondents) prefer online learning only, 48.88% (391 respondents) prefer offline learning only, and 15.38% (123 respondents) are open to either online or offline learning methods.

(b) Winters

Table No .9 : Winters

Winters	Respondent	Percentage
Online only	342	42.75
Offline only	244	30.5
Any of Online or Offline	214	26.75
Total	800	100

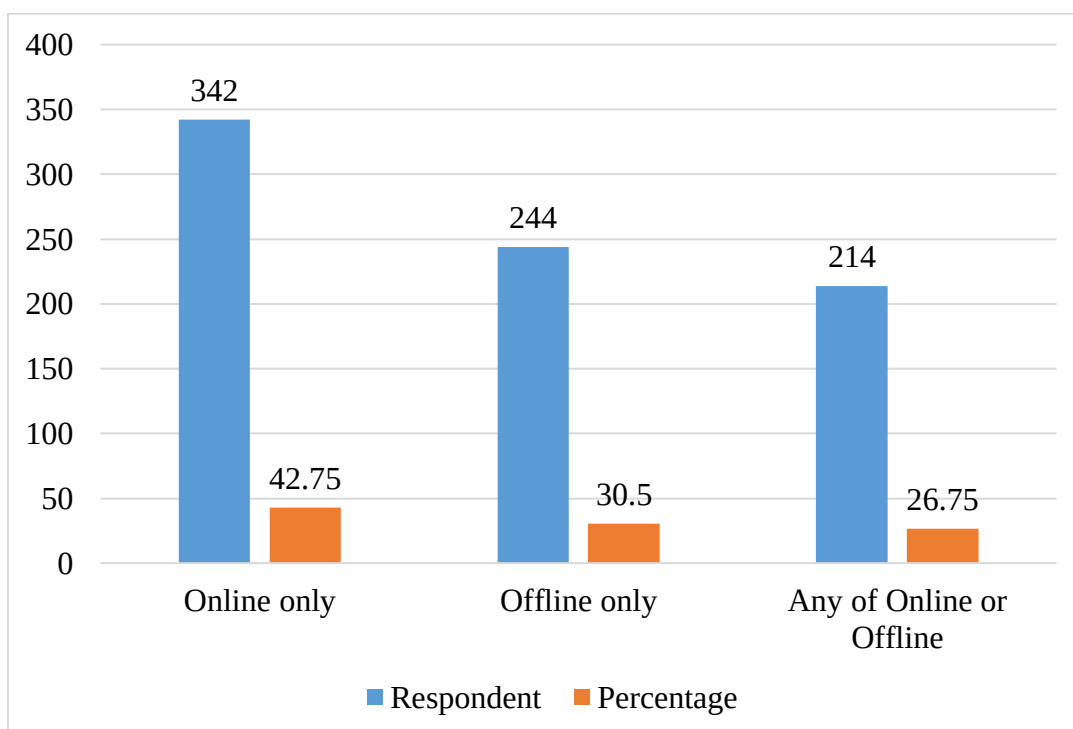


Figure No. 7: Winters

Interpretation: As shown in the figure above, respondents were asked about their preferred mode of learning during the winter season. The results indicate that 42.75% (342 respondents) prefer online learning only, 30.5% (244 respondents) prefer offline learning only, and 26.75% (214 respondents) are open to either online or offline learning methods.

(c) Rainy

Table No. 10: Rainy

Rainy	Respondent	Percentage
Online only	384	48
Offline only	77	9.63
Any of Online or Offline	339	42.38
Total	800	100

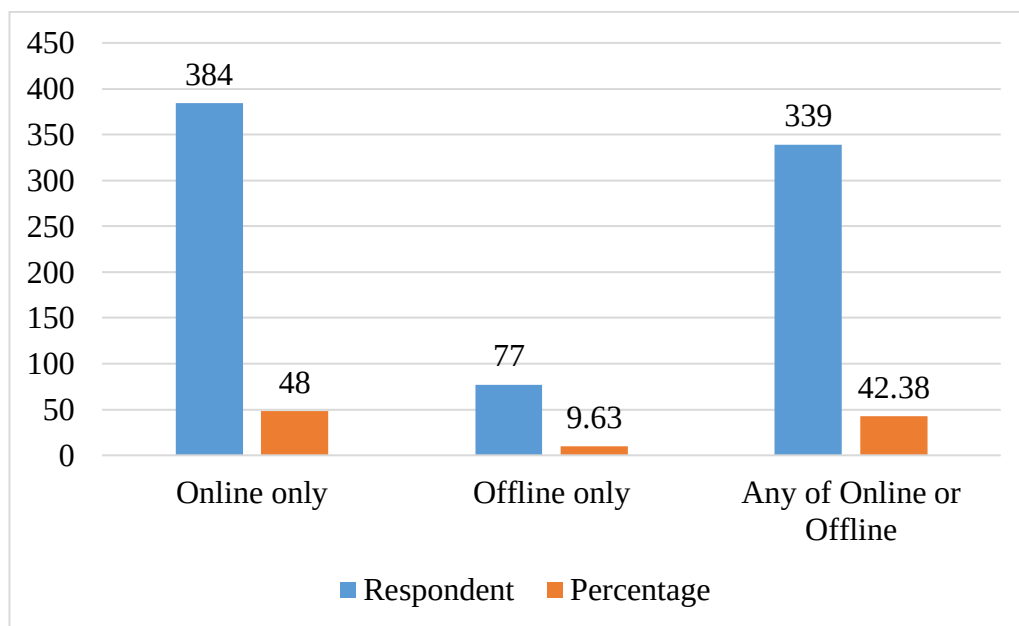


Figure No. 8: Rainy

Interpretation: As shown in the figure above, respondents were queried about their preferred mode of learning during rainy weather conditions. The findings reveal that 48% (384 respondents) favor online learning exclusively, 9.63% (77 respondents) opt for offline learning exclusively, and 42.38% (339 respondents) are comfortable with either online or offline learning methods. This distribution highlights a notable preference for online learning during rainy conditions, with a significant proportion also open to using both modes interchangeably.

Table No.11: The most effective way to attend the online classes

The most effective mode to attend the online classes	Respondent	Percentage
Computer – Desktop/laptop	654	81.75
Mobile	145	18.13
Smart TVs	1	0.13
Total	800	100

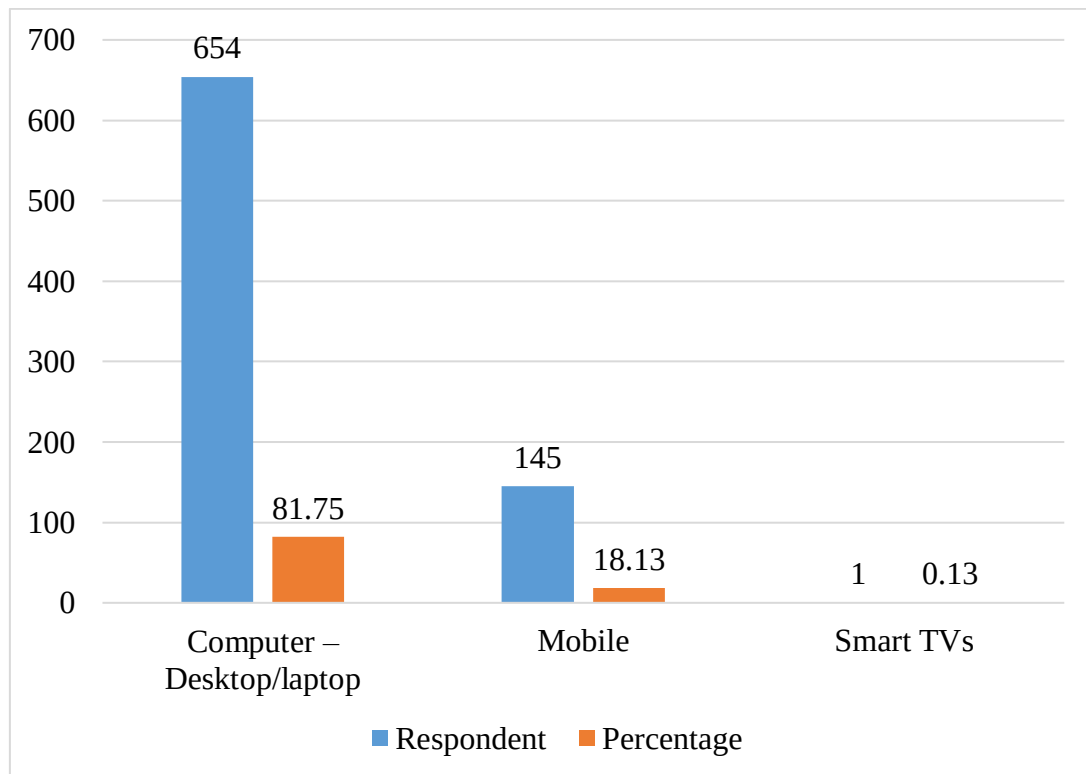


Figure No. 9: The most effective mode to attend the online classes

Interpretation: As shown in the figure above, respondents were asked to indicate the most effective device for attending online classes. The results show that

81.75% (654 respondents) prefer using a computer (desktop or laptop), 18.13% (145 respondents) use a mobile device, and a negligible percentage of 0.13% (1 respondent) utilize smart TVs.

First Hypothesis

H0: There is no significant difference between the effectiveness of online and offline education provided by higher educational institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online and offline education provided by higher educational institutes in south-east Rajasthan.

Table No. 12: First Hypothesis

	Mean	Variance	Observations	df	t Stat	P(T<=t) two-tail	t Critical two-tail
<i>Male</i>	2.554	1.205	498	798	-1.790	0.074	1.96
<i>Female</i>	2.698	1.254	302				

Conclusion: The p-value is more than .05, therefore H0 is accepted. It is concluded that there is no significant difference between the effectiveness of online and offline education provided by higher educational institutes in south-east Rajasthan.

Second Hypothesis

H0: There is no significant difference between opinion of male and female students on the effectiveness of the online education.

H1: There is significant difference between opinion of male and female students on the effectiveness of the online education.

Table No. 13 Second Hypothesis

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Urban	351	921	2.623932	1.212454
Rural	247	618	2.502024	1.234752
Semi-Urban	202	548	2.712871	1.23058

Table No. 14: Anova

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	5.084253	2	2.542127	2.077057	0.125976	3.007021
Within Groups	975.4545	797	1.223908			
Total	980.5388	799				

Conclusion: The p-value is more than .05, therefore H₀ is accepted. It is concluded that there is no significant difference between opinion of male and female students on the effectiveness of the online education.

Third Hypothesis

H₀: There is no significant difference between the opinion of students about online education residing in rural and urban areas in south-east Rajasthan.

H₁: There is significant difference between the opinion of students about online education residing in rural and urban areas in south-east Rajasthan.

Table No. 15: Third Hypothesis

	Mean	Variance	Observations	df	t Stat	P(T<=t) two-tail	t Critical two-tail
Private	2.630372	1.210684	349	798	0.48541	0.627519	1.962941
Government	2.592018	1.242069	451				

Conclusion: The p-value is more than .05, therefore H0 is accepted. It is concluded that there is no significant difference between the opinion of students about online education residing in rural and urban areas in south-east Rajasthan.

Fourth Hypothesis

H0: There is no significant difference between the effectiveness of online education provided by private and government institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online education provided by private and government institutes in south-east Rajasthan.

Table No. 16: Fourth Hypothesis

	Mean	Variance	Observations	df	t Stat	P(T<=t) two-tail	t Critical two-tail
<i>Technical</i>	2.657407	1.216632	324	798	1.024986	0.305681	1.962941
<i>Non-Technical</i>	2.57563	1.234268	476				

Conclusion: The p-value is more than .05, therefore H0 is accepted. It is concluded that there is no significant difference between the effectiveness of online education provided by private and government institutes in south-east Rajasthan.

Fifth Hypothesis

H0: There is no significant difference between the effectiveness of online education provided by technical and non-technical institutes in south-east Rajasthan.

H1: There is significant difference between the effectiveness of online education provided by technical and non-technical institutes in south-east Rajasthan.

Table No. 17: Fifth Hypothesis

	Mean	Variance	Observations	df	t Stat	P(T<=t) two-tail	t Critical two-tail
<i>online</i>	2.60875	1.227207	800	1598	5.249556	1.72921E-07	1.961449616
<i>Offline</i>	2.3325	0.988179	800				

Conclusion: The p-value is less than .05, therefore H₀ is rejected. It is concluded that there is significant difference between the effectiveness of online education provided by technical and non-technical institutes in south-east Rajasthan.

11. Findings and Conclusion

On the other hand online teaching in the higher education was become more popular in India during COVID-19 as the only option to continue the education flow among the students of India. Not only computers but also the computer based devices such as mobiles, tablets were also widely used for delivering and taking classes by teachers and students. Various applications are available for online classes such as googleclassroom, zoom, telegram, Microsoft team. Both method are effective in teaching in the college education. The basic meaning of offline education is classroom teaching in the college campus whereas the online teaching means to teach the students using the computer or mobile applications in internet.

The offline education required lot of physical resources and physical presence which is more effective in delivering the education by collecting the students in one classroom and maintaining the teaching environment by the institutes. The interaction between the teacher and student does not depend much on the computer and internet technology based devises. Though it can be used as an additional tools

for preparing and delivering a lecture. This method was the only method before invent of the computer and internet technology online method.

According to Indian higher education system the classes should be conducted in the traditional classroom offline way of teaching. Though they want to provide the students the latest examples, good content and exposure through the literature available on internet. There are so many websites which provides very quality content. But this is left on the teachers, no proper guidelines are issued for it. On the other hand online teaching in the higher education was become more popular in India during COVID-19 as the only option to continue the education flow among the students of India. Not only computers but also the computer based devices such as mobiles, tablets were also widely used for delivering and taking classes by teachers and students. Various applications are available for online classes such as googleclassroom, zoom, telegram, Microsoft team.

The mobile was banned in the campus before COVID-19, but thereafter during COVID-19 the need of the time a new method of teaching i.e online teaching was evolved around the globe so as in India. But soon after COVID-19 gone the higher education guidelines shifted back the entire education system towards offline classroom system. But by this time every stake holder in higher education got to that online teaching is also an effective method of teaching. Today the students take their private tuitions and coaching online for the good understanding of their subject matter. So instead of getting back students to the classroom the higher education norms maker should develop a new education system which allow the student to take the classes online also for the subjects which can be easily taught on it. and develop the virtual classroom system for the teachers and students which will develop the student's skills and knowledge in their subject area. The future will be of online education but it should give a feel of real classroom. This virtual online education institutes should be created which does not limit the students by their physical presence.

The emergence of online learning has revolutionized the field of education, presenting both new opportunities and difficulties for conventional educational establishments. Access to education has been democratized by online learning, which has increased affordability, flexibility, and accessibility. Learning institutions now face new competition and opportunities due to the rise of new learning platforms and delivery techniques. In order to stay competitive, traditional educational institutions have had to adjust to the changing digital landscape of education by making innovations and investments in new infrastructure and technology. In terms of certification and quality control, online learning has brought out new difficulties, but it has also given educational institutions new chances to increase their influence and reach. All things considered, traditional educational institutions have been greatly impacted by online education, and this impact will only increase in the years to come.

Additionally, a computer or mobile device and a dependable internet connection are needed for online learning. For students from low-income families who do not have access to these services, this can be a major obstacle.

There has been a lot of discussion in recent years over how online learning affects student involvement. Online learning has several advantages over traditional classroom settings, including flexibility and accessibility, but there are worries that it may not be as good at engaging students.

Keeping students interested in online learning is one of the biggest obstacles. Online learning environments lack the interpersonal communication and social dynamics found in traditional classrooms, which can help maintain students' motivation and engagement. Feelings of loneliness and alienation from the educational process may result from this.

On the other hand, interactive and multimedia materials like movies, animations, and virtual simulations present special chances for online learning to engage

students. Online learning platforms can also give students individualized feedback and support, which can raise their motivation and level of involvement.

eachers need to create lively, pertinent, and interesting courses if they want to successfully include students in an online learning environment. This necessitates giving serious thought to instructional design tenets like peer collaboration, active learning, and practical applications.

The employment market has been greatly impacted by online learning, which gives people new chances to improve their knowledge and abilities and increase their marketability to employers. Since people may now access education from anywhere at any time, they are no longer constrained by their job schedules or physical location thanks to the growth of online learning.

Additionally, the skills gap that exists in many areas has been filled in part by online learning. Finding qualified personnel who can satisfy the expectations of the job market is becoming more and more challenging for companies due to the rapid speed of technological change. This issue can now be solved with online learning since people may now access training and certification programs that provide the necessary abilities.

Historically underprivileged populations now have easier access to education because to online learning. Now, education and training that was previously unattainable is available to those who might not have had access to traditional schooling, such as working professionals, low-income people, and residents of remote areas.

Furthermore, new avenues for professional growth and career promotion have been made possible via online learning. Nowadays, people can improve their jobs and raise their earning potential by acquiring degrees, certifications, and badges online.

Traditional educational institutions face numerous obstacles. An important obstacle is the growth of virtual education, which is upending the conventional paradigm of lecture-based learning. In order to stay relevant, traditional universities must compete with the many advantages that online learning offers, including price, flexibility, and accessibility.

Adapting to the evolving demands and expectations of students is another difficulty faced by traditional educational institutions. Students nowadays demand their education to be relevant to their job aspirations, engaging, and individualized, as they are more tech-savvy and varied than in the past. In order to satisfy these shifting expectations, traditional institutions must adapt their curricula and teaching strategies.

The rising expense of education is another issue, burdening both institutions and students financially. While universities are dealing with budget constraints and declining enrollment, many students are finding it difficult to pay the exorbitant cost of tuition. Competition for funds and resources has intensified as a result, which may have an effect on the standard and accessibility of education.

The capacity of online education to provide students with access to courses and programs at any time and from any location has led to its growing popularity. Learners can now accomplish their academic and professional goals without being limited by time or place thanks to the accessibility and flexibility of online education. With many courses and programs offered at lower costs than traditional learning institutions, online education has also become more accessible.

Blended learning and flipped classrooms are two novel delivery modalities that have emerged as a result of online education. While flipped classrooms use traditional classroom instruction for in-person learning and online instruction for homework, blended learning integrates both forms of instruction. Learning

institutions now have more options to provide education to students thanks to these innovative delivery methods.

In terms of certification and quality control, online education has presented new difficulties for conventional educational establishments. It has become more challenging for universities to maintain accrediting standards and educational quality as more online courses and programs become available. The legitimacy and credibility of online education have come under scrutiny as a result of this. Traditional educational institutions now have additional ways to reach a wider audience and make a bigger difference thanks to online education. Institutions can now reach a global student body through online programs and courses, generating new revenue streams and extending their influence beyond conventional geographic bounds.

Both offline or online are simple and effective methods of learning that prioritize ease of access and flexibility. The physical infrastructure is not so fascinating, ensuring a conducive environment for learning, while online classes boast impressive technological setups. Timely schedules and advanced teaching pedagogy, including interactive PowerPoint and audio-visual presentations, enhance comprehension. Lectures are delivered clearly with visible and high-quality content, ensuring students grasp concepts effectively. Recorded lectures are available for review, promoting thorough understanding. The classroom environment is welcoming, with teachers exhibiting excellent behavior and facilitating discussions that deepen understanding. They adapt their explanations to suit the complexity of topics, ensuring every concept is comprehended. Moreover, one-on-one doubt-solving sessions and interactive discussions are being conducted but students are not so much satisfied with it among peers foster a sense of belonging and reduce stress. The institute further enriches student experiences through seminars and lectures by industry experts, promoting exploration and holistic development.

The study aimed to explore various dimensions of online education effectiveness compared to traditional offline methods and to investigate differences in student opinions across different demographics in south-east Rajasthan. The results provide insights into the relative effectiveness of these educational approaches and highlight variations based on student characteristics and institutional types.

Firstly, the study tested whether there was a significant difference between the effectiveness of online and offline education. The analysis revealed a p-value of 0.074, which is greater than the 0.05 significance level, leading to the acceptance of the null hypothesis. This finding indicates that there is no significant difference in the effectiveness of online versus offline education within higher educational institutes in south-east Rajasthan. Both methods appear to deliver comparable educational outcomes based on the current data.

In exploring whether there are differences in opinions between male and female students regarding the effectiveness of online education, the study found a p-value of 0.126. Since this p-value exceeds 0.05, the null hypothesis was accepted. This result suggests that male and female students have similar views on the effectiveness of online education, and there is no significant gender-based difference in their perceptions of this mode of learning.

The research also examined if there were significant differences in opinions on online education between students from rural and urban areas. With a p-value of 0.628, which is well above the 0.05 threshold, the null hypothesis was accepted. This indicates that students from both rural and urban backgrounds share comparable opinions about the effectiveness of online education, suggesting that geographical location does not significantly affect students' views on this educational method.

Another aspect investigated was the difference in effectiveness between online education provided by private versus government institutes. The p-value of 0.306

led to the acceptance of the null hypothesis, indicating no significant difference in effectiveness between online education programs offered by private and government institutions. This finding highlights that both types of institutions achieve similar educational outcomes through their online programs.

The final hypothesis tested whether there is a significant difference in the effectiveness of online education between technical and non-technical institutes. Here, the p-value was 1.73E-07, which is significantly less than 0.05, leading to the rejection of the null hypothesis. This result reveals a significant difference in the effectiveness of online education between technical and non-technical institutes, suggesting that the type of academic program can influence how effective online education is perceived and implemented.

In summary, the study's findings reveal that online and offline education methods are similarly effective, and student opinions on online education do not vary significantly based on gender or geographic location. Additionally, there is no notable difference in effectiveness between online programs at private versus government institutes. However, the study did uncover a significant difference in the effectiveness of online education between technical and non-technical institutes. These insights are valuable for educators and policymakers aiming to enhance online education strategies and address specific needs across different educational contexts.

12. SUGGESTIONS AND FUTURE SCOPE

7.1 Suggestion

Traditional educational institutions have been influenced by the growth of online education in a number of ways.

Use Blended Education: Both online and offline are effective method of teaching and they they have their own advantages. The UGC should issue the guidelines to

the University to conduct the classes in both modes as when required. The Board of Academic Council of the Universities should conduct the meeting to discuss which part of the syllabus need to be taught in offline and which part can be taught in either ways.

Developing Infrastructure: In India the infrastructure facilities are not good enough. Though some private institutions have good infrastructure for offline classes. But they all are lagging far behind the international standards as followed in the developed countries. Still some of the institutions have a very uncleaned, unpainted and unplastered buildings. Infrastructure for the online education, is more or less in the same condition. Though, it has been improved with the easy and low cost internet facility in India now. But the institutes don't train their teachers and do not create a classroom from where the online classes can be taken effectively.

Train the Teachers: The institute should train their teachers for taking classes online effectively on the online softwares. Many teachers are yet not so friendly with the technology. They write the notes on paper and share them with students. Sometimes their handwriting are not visible also. This need to be improved by provided computer and software training to the teachers.

Provide the computer free or at subsidized prices: The institute should provide the computer system free or at subsidized prices to the students based on their economic conditions.

Mode can be shifted from offline to online mode in case of adverse weather conditions: In the adverse weather conditions instead of calling off the classes or taking classes with very less number of students, an online classes can be conducted.

Develop a set-up for online live classes: Institute must develop the system in case some students fail to come to the institute they can attend the class online also. An

AI tool should be used for recording the student screen time present during the live classes.

Use some dedicated software for online: The dedication application developed for online classes comes with many utilities such as attendance recoding, properly scheduling the classes and sharing the information with students, various visual ads are there in it and so on.

Provide recorded lectures to the students: The lectures of the teachers should be recorded which should be provided to the students so that they will be able to refer them later also.

Provide the topic to be discussed and brief content related to it a day before the class: A brief tutorial of the class content should be provided to the students by the teachers a day before the class. The tutorial in advance will help the students get to know the connection between the classes. And in case some student has not attended the past classes can also get ready for the next class. This is very effective as students already read what is going to explained and discussed in their class.

Provide the status of the regular course and value the online courses conducted:

The online courses are mostly taken by the tech students for their skill development. Also online personality development, languages improvement courses are available on internet. Besides above the courses are there for the aspirants of different streams. Most of the above said courses are being conducted by the private tutors, companies and not by higher education department. So there is a need that such short term courses should be designed by the higher education department and universities for the students looking present market need. The training provided and certification issued should be valued by the nation recruitment agencies private as well as government.

Develop a Feedback and Review System: The student feedback is must to enhance the teaching effectiveness. The shortcomings reported by the students should be addressed and resolved at the earliest. The critics should be taken as the aspects of improvement. No one should be blamed and encourage everyone to improvise the system. Positive motivation should be there in the system for the teachers also.

The new digital educational environment has required traditional educational institutions to adapt. In order to provide programs and courses online, numerous institutions have had to make investments in new infrastructure and technologies. Both large financial outlays and adjustments to institutional culture have been necessary for this.

13. Future Scope

This study will be helpful to improve the higher education system in India. The new teaching methods should be adopted by the system as suggested in this thesis. The conclusion will be very helpful for the higher education department, universities and the institutes to understand the student perspective towards the online and offline learning system.

The researchers will get the various factors studied and presented in this thesis. Data collected from the students of the institutes of the South-East Rajasthan and analysed. It provides the insights about the online education delivered to the students during the COVID-19 period. Most of the student attended the online classes very first time. Some found it satisfactory and some not. The internet connectivity and poor way of conducting the lectures has revealed that our higher education system need to be improved. Therefore the findings, conclusion and suggestions will prove very helpful for all the stakeholders of higher education system in India.

The advantages of the online learning methods can be available by redesigning the education guidelines. This report will be very helpful for the students and researchers to understand the ground reality of the Indian online education system.

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