



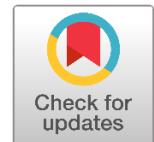
Original Article

PREFERENCE FOR ONLINE CLASSES DURING THE COVID-19 PANDEMIC: A 'D-NEEDS' HIERARCHICAL APPROACH AMONG POSTGRADUATE STUDENTS

Bijith Vakkalary ^{1*}, Pragathi Aravaboomi ²

¹ Assistant Professor, PG Department of Journalism and Communication, Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous), Arumbakkam, Chennai-600106, India

² Assistant Professor and Head, PG Department of Journalism and Communication, Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous), Arumbakkam, Chennai-600106, India



ABSTRACT

The Covid-19 pandemic affects all over the world and it disrupted the human life. The educational sector is one of the most affected sectors due to the Covid-19 pandemic. Educational institutes are shut down due to the lockdown and the classes are shifted to online mode. But there are some irregularities noticed in students attending online classes. Thus, the reason behind the study is to discover the deficiency needs of the students and their preference towards the acceptance of online classes during the Covid-19 pandemic. The findings reveal that the students have an unfavourable attitude towards the online classes. This particular research was perpetrated on 100 postgraduate students in Kerala and Tamil Nadu to analyse their preference for online classes. Primary data collected through a questionnaire. Research question and hypothesis were tested with statistical tools.

Keywords: D-needs, ICT, Technology, Comfortability, Support, E learning, Accessibility.

INTRODUCTION

The impact of the Covid-19 pandemic affects everywhere the globe. It disrupted human life in every sector around the world. Lockdown compelled the people to maintain social distancing as the first prevention step from Covid-19. People are forced to avoid social gatherings and it completely affects normal life. The pandemic also disrupted the educational sector in many ways. The government systems are taken the action to limit social contact for reducing the spread of the Coronavirus. Educational institutes are shut down due to lockdown. The offline regular classes are suspended and the examinations were postponed. Unstructured schedules and uncertainty in a new situation compelled to seek an alternative option to continue the functioning of educational institutions. Universities and schools are opted for the web mode of classes to beat the uncertainty of the Covid-19 pandemic. As per the expansion of the Covid-19 Situation the requirement of online classes is additionally increased. the traditional model of face-to-face classes is replaced by online classes. As a result, Covid-19 Pandemic compelled the students to shift to online mode of learning.

The pandemic situation results in the collapse within the academic calendar and makes some uncertainty within the smooth completion of the courses. New semester classes are started lately online. Initially, teachers and students were a bit confused with the newly adapted mode. Besides slowly people were trying to regulate to the conditions. The face-to-face offline classes in campus atmosphere with friends and teachers replaced by online classes. Which is widely used the chances of online social networking sites and other online platforms. The Lectures are converted to ppts and books are replaced by Pdf. Covid-19 Pandemic worked as a

*Corresponding Author:

Email address: Bijith Vakkalary (bijithvakkalary@gmail.com)

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catalyst for online educational platforms. the academic activities like presentations, assignments, projects, examinations. Etc are conducted and submitted via the net. Online education is introduced to boost the pliability and convenient mode of education, but the sudden compelled shift makes some students have a negative approach towards online classes.

Moreover, a surge in Covid-19 has resulted in online classes become a part of reality thus increasing its relevance. The situation makes the life of students more uncertain. Students are faced with many social, psychological, emotional, and technological challenges during this period. The current study approaches the deficiency needs of post-graduate students during the Covid-19 Pandemic and their preference towards the acceptance of online classes in terms of Technology, Comfortability, and also the support.

REVIEW OF LITERATURE

[Van et al. \(2020\)](#) Conduct a study on students' perception of online classes with the hierarchy of factors. The seven factors Basic online modality, Teaching presence, Instructional support, cognitive presence, Interactive online modality, social online comfort, and social presence that are reliable, coherent, and significant under different conditions. Instructional support is the perception of students towards the input, rehearsal, feedback, evaluation from the side of instructor. Quality of communication in lectures, directions, encouragement, and individual feedback is referred to as Texting presence. Competent use of basic online tools, navigation methods, online grid book, and online grading comes under online modality. Social presence is the interaction between the students. The ability of the instructor to provide a comfortable environment is called online social comfort. Cognitive presence is the critical and deep understanding of materials from a different perspective. The interactivity in an online class is referred to as Interactive Online Modality. Students prefer traditional mode study due to learning style preference and poor past experience. There is an adverse attitude in students against online classes because they experience a shoddy basic functional competence, Poor instructional design, sporadic teaching presence, and poorly implemented cognitive and social aspects.

[Kulal and Nayak \(2020\)](#). Conducted a study on perception of teachers and students toward online classes in Dakshina Kannada and Udupi District. They used a descriptive quantitative research design. Undergraduate, postgraduate, and college teachers are the respondents of this study. According to the study, students are getting enough support from teachers. Lack of training for teachers to conduct online classes and technical issues are the major barriers of online classes. In this study, the opinion of the student towards online classes is explained based on the impact, Comfortability, and support of Teachers in online classes. This research concluded that both students and teachers have an optimistic view of online classes. E-learning contains a more significant role to play in the future but it cannot be the replacement to traditional classes. This study tries to grasp the obstacles of online learning and take corrective measures to overcome them.

[Lederer et al. \(2020\)](#) Conduct a study on the unique needs of U.S. College students during the Covid-19 Pandemic. They consider the mental health concern and academic success of the students. They also give attention to the hearings and food insecurities, financial problems, lack of socializing and sense of belongingness, improper accessibility, and uncertainty about the future. This research recommends more clarity communication, prioritize student support services and use employ equitable system in the education sector. The authors mentioned about the social and emotional issues faced by students. In this research, the students from the LGBT community and their needs during a pandemic are also mentioned.

Perception of equivalence between online and face-to-face academic activities by undergraduate medical students during the Covid-19 Pandemic [Hundekari et al. \(2020\)](#). They conduct an observational study and understand that students have a negative perception of online learning. Students more prefer face-to-face classes to online classes due to better interactive platforms. Even though online classes help the students to gain knowledge and engage them in studying to some extent. But students aren't much comfortable in online classes when compares to face-to-face classes.

According to [Kundu and Nath \(2018\)](#). The long run development in ICT-based education depends on the speed of broadband, availability of devices, improvement in infrastructure, and government initiatives. They find out web mode of education would be increased collaboration between learners in all segment. Barriers to utilizing ICT in education in India with a special focus on rural areas suggest developing more infrastructure and facilities for ICT-based education.

[Larreamendi-Joerns and Leinhardt \(2006\)](#), mentioned the shift from an offline mode of learning to online mode learning as "online class is an optional" to "online class is necessary". This study determines the gaining of the importance of online mode of learning. According to [Lee and Rha \(2009\)](#), Institutional support is an important element of presence of teaching presence. This study emphasis on structured interactions which enhance the flexibility of understanding.

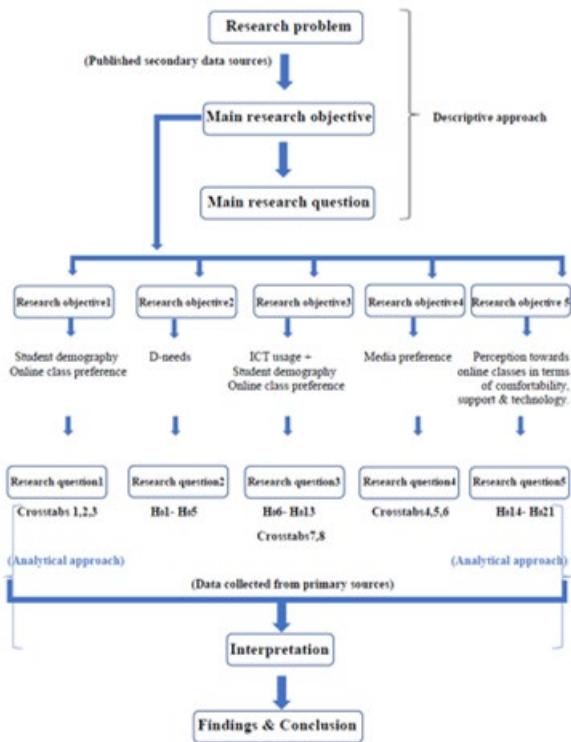
RESEARCH METHODOLOGY

The present research paper is a quantitative study and it is based on primary data. This study utilized a Descriptive- Analytical research design by using survey method. It includes collecting data, modelling, analysing the data and evaluating the results. Purposive sampling under the Non-probability sampling method is used for this study. The sample was collected from postgraduate students of Kerala and Tamil Nadu. They are coming under the streams of Arts and Science. The population also diversified in

demographic profiles like age, gender, stream of study, nativity, and monthly family income. In total 157 responses are collected and filtered them into 100 samples due to incomplete or redundant responses.

CONCEPTUAL FRAMEWORK

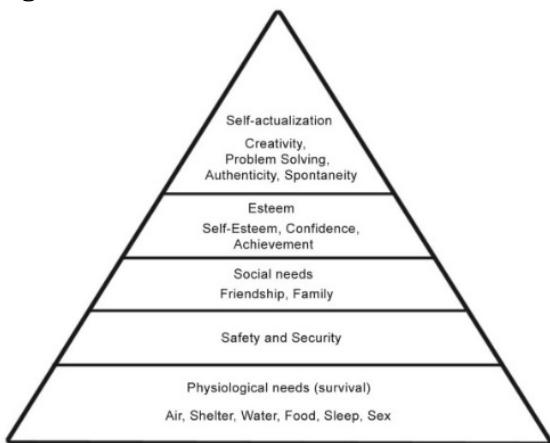
Figure 1



MASLOW'S HIERARCHY OF NEEDS THEORY

The theory was proposed by Abraham Harold Maslow in his paper "A theory of Human motivation" on 1943. Maslow divides the human needs into five hierarchical levels within a pyramid and arranged them from bottom to top.

Figure 2



In this study tries to understand the 'd-needs' of postgraduate students and their perception towards acceptance of online classes. Proper housing facilities and adequate food to eat at home come under the physiological needs. Financial support from safety needs. family atmosphere, and loneliness feelings from social needs (love and belongingness need). Education is connected with all five needs in levels of hierarchy.

DATA ANALYSIS AND INTERPRETATION**Table 1**

Table 1 Cross Tabulation Between Gender of the Respondents and Acceptance of Online Classes			
Gender of the respondents	Acceptance of online classes.		Total
	Yes	No	
Female	11	39	50
Male	9	41	50
Total	20	80	100

Out of 100 respondents, 80% have an unfavourable attitude towards the acceptance of online classes. The male and female respondents are equally distributed. Out of 50 female respondents, 39 are not preferred online classes. That is 78% of the female respondents. Out of 50 male respondents, 41 are not preferred online classes. That is 82% of the male respondents. Only 20% of the total respondents have a Favourable attitude towards the acceptance of online classes. The above table reveals that when compares to female respondents, male respondents are a slightly more unfavourable attitude towards acceptance of online classes.

Table 2

Table 2 Cross Tabulation Between Gender of the Respondent and Media Preference for Online Classes				
Gender of the respondents	Media preference for online classes			Total
	Laptop	Mobile	Personal computer	
Female	7	42	1	50
Male	13	36	1	50
Total	20	78	2	100

The male and female respondents are 50 in number and they are equally distributed. Out of 50 female respondents, 7 are using laptops, 42 are using Mobile phones, and only one using a personal computer for attending online classes. 84% of the female respondents are chosen mobile phones for attending online classes. Out of 50 male respondents, 13 are using laptops, 36 are using Mobile phones, and only one using a personal computer for attending online classes. 72% of the male respondents are chosen mobile phones for attending online classes. 14% of the female respondents and 26% of male respondents are chosen laptops for attending online classes. That means male respondents are more preferred laptops for online classes than female respondents.

When compare the female and male respondents, they have shown a 12% difference in mobile phone preference for attending online classes. That means female respondents are more preferred mobile phones for attending online classes than male respondents. Out of 100 respondents, 78% are preferred mobile phones for attending online classes.

The above table reveals that mobile phones are the most preferred medium for attending online classes.

Table 3

Table 3 Cross Tabulation between Acceptance of Online Classes and their ICT usage Parameters							
Acceptance of online classes	Length of internet usage	Frequency of internet usage	Average Normal hours spent at online				Total
			Less than 1/3hrs	1-2 hrs	3-4 hrs	More than 4 hrs	
Yes	From last 1year	Every day	0	1	0	0	1
		Last 2years	Every day	0	1	0	1
	Last 3years	3-5times	0	0	1	1	1
		Every day	1	1	2	4	8
	More than 5years	3-5times	0	0	1	0	1
		Every day	0	1	3	4	8
	From last 1year	Every day	0	0	1	0	1

	Last 2years	Every day	1	2	2	1	6
		3-5times	0	1	2	0	3
No	Last 3years	Every day	1	6	5	7	19
		3-5times	0	1	1	0	2
	More than 5years	Every day	0	4	20	24	48
		3-5times	1	0	0	0	1
Total			4	18	37	41	100

Out of 100 respondents, 80 have an unfavourable attitude towards the acceptance of online classes. There are 74 respondents who are everyday internet users from this category. 49 are using the internet for more than the last 5 years and 21 are using the internet for the last 3 years. 32 respondents are spent an average normal time per day more than 4 hours and 31 are spent 3-4 hours. There are 20 respondents who have favourable attitude towards acceptance of online classes. Out of them, 18 are everyday users. 8 are using the internet for more than the last 5 years and 9 are using the internet from the last 3 years. 9 respondents are spent an average normal time per day more than 4 hours and 6 are spent 3-4 hours. The above table reveals that from the category of respondents who have unfavourable attitudes towards online classes, 92% are everyday internet users.

Table 4**Table 4 McNemar's Test for Dichotomous Categorical Association between Respondents "Proper housing facilities" and "Adequate food to eat at home"**

	Proper housing facilities	Adequate food to eat at home		Total	Significant value
		Yes	No		
Yes	96	1		97	
No	3	0		3	0.625
Total		99	1	100	

Not significant at 0.05 level ($p = 0.625 > 0.05$)

Hence the null hypothesis, "Ho1: Respondents "Proper housing facilities" will have no significant association with "adequate food to eat at home"" is accepted. That means there is no significant association between respondents "Proper housing facilities" and "adequate food to eat at home". From the above table 97% of the total respondents have proper housing facilities and 99% of the respondents have adequate food to eat at home. Out of 100 respondents, only one of the respondents has not adequate food to eat at home.

Table 5**Table 5 Mcnemar's Test for Dichotomous Categorical Association Between Respondents "Adequate Food to Eat at Home" and "Pleasant Family Atmosphere"**

	Adequate food to eat at home	Pleasant family atmosphere		Total	Significant value
		Yes	No		
Yes	90	9		99	
No	0	1		1	0.004
Total		90	10	100	

Significant at 0.01 level ($p = 0.004 < 0.05$)

Hence the null hypothesis, "Ho2: Respondents "Adequate food to eat at home" will have no significant association with "Pleasant family atmosphere"" is rejected. That means Respondents "Adequate food to eat at home" have significant association with "Pleasant family atmosphere". From the above table, it is clear that out of 100 respondents 90 have a pleasant family atmosphere. When the family atmosphere is not pleasant it will affect the physiological needs of the respondents. Here majority have a pleasant family atmosphere. So, the basic physiological needs are met.

Table 6

Pleasant family atmosphere		Feel loneliness in house		Total	Significant value
		Yes	No		
Yes	11	79	90		
	No	9	1	10	0
Total		20	80	100	

Significant at 0.01 level (p = 0.000 < 0.05)

Hence the null hypothesis, "Ho3: Respondents "Pleasant family atmosphere" will have no significant association with "Feel loneliness in house"" is rejected. That means Respondents "Pleasant family atmosphere" have significant association with "Feel loneliness in house". The majority of the respondents have a pleasant family atmosphere and they do not feel lonely at home.

Table 7

Feel loneliness in house		Proper financial support		Total	Significant value
		Yes	No		
Yes	13	7	20		
	No	77	3	80	0
Total		90	10	100	

Significant at 0.01 level (p = 0.000 < 0.05)

Hence the null hypothesis, "Ho4: Respondents "Feel loneliness in house" will have no significant association with "Proper financial support"" is rejected. That means there is a significant association between Respondents "Feel loneliness in house" and "Proper financial support". The majority of the respondents have proper financial support and they do not feel lonely in house.

Table 8

Proper financial support		Proper housing facilities		Total	Significant value
		Yes	No		
Yes	89	1	90		
	No	8	2	10	0.039
Total		97	3	100	

Significant at 0.01 level (p = 0.000 < 0.05) Hence the null hypothesis, "Ho5: Respondents "Proper financial support" will have no significant association with "Proper housing facilities"" is rejected. That means there is a significant association between Respondents "Proper financial support" and "Proper housing facilities". Out of 100 respondents 97% have proper housing facilities and 90% have proper financial support.

Table 9

Table 9 One-way ANOVA Test for the Influence of Age of the Respondents on their Length of Internet usage					
Length of Internet usage	Sum of Squares	Degrees of freedom	Mean Square	F ratio	Significant value
Between Groups	2.315	3	0.772	1.322	0.272
Within Groups	56.045	96	0.584		
Total	58.36	99			

The "F" ratio (1.322) for the influence of age of the respondents on their length of internet usage are not significant at 0.05 level ($p = 0.272$). Hence the null hypothesis, "Ho8: There will be no significant difference among age of the respondents and their length of internet usage" is accepted. It means Age of the respondents does not have any effect on their length of internet usage. So, there is no significant difference among age of the respondents and their length of internet usage.

Table 10

Table 10 Chi-Square Test for Association Between Gender of the Respondents and their Length of Internet Usage						Pearson Chi-Square		
Gender of the respondent	Length of Internet usage				Total	Pearson Chi-Square		
	From last 1year	Last 2years	Last 3years	More than 5years		Chi-Square Value	df	Significant value
Female	2	9	18	21	50			
Male	0	2	12	36	50	11.602	3	0.009
Total	2	11	30	57	100			

Chi-Square Value: 11.602

Significant at 0.009 level ($p < 0.01$)

Hence the null hypothesis, "Ho12: There will be no significant association between gender of the respondents and their length of internet usage" is rejected. That means there is a significant association between gender of the respondents and their length of internet usage. The length of internet usage is more among male respondents than female respondents.

Table 11

Table 11 Chi-Square Test for Association Between Female and Male Respondents in their Agreement Towards "I Receive Enough Support and Resources from My Teacher"						Pearson Chi-Square			
Gender of the respondents	I receive enough support and resources from my teacher					Total	Pearson Chi-Square		
	Strongly Disagree	Disagree	Agree	Strongly Agree			Chi-Square Value	df	Sig.
Female	0	6	30	14	50				
Male	1	15	29	5	50	9.137	3	0.028	
Total	1	21	59	19	100				

Chi-Square Value: 9.137

Significant at 0.028 level ($p < 0.05$)

Hence the null hypothesis, "Ho14: There will be no significant association between female and male respondents in their agreement towards "I receive enough support and resources from my teacher"" is rejected. That means there is a significant association between gender of the respondents and their agreement towards "I receive enough support and resources from my teacher". Both male and female respondents differ in their perception towards receiving support and resources from teachers during Online classes. Female respondents differ in their attitude towards receiving support and resources from teachers during the online classes. Female respondents are more favourable than male respondents towards the resource provisions during the online classes.

Table 12**Table 12 Chi-Square Test for Association Between Arts and Science Students in their Agreement Towards "I Abide by Guidelines for Effective Communication and Interaction in an Online Class Set by Teachers"**

Stream of study of the respondents	I abide by guidelines for effective communication and interaction in an online class set by teachers.					Total	Pearson Chi-Square		
		Strongly Disagree	Disagree	Agree	Strongly Agree		Chi-Square Value	df	Sig.
Arts	4	12	20	14	50				
Science	5	16	26	3	50	8.583	3	0.035	
Total	9	28	46	17	100				

Chi-Square Value: 8.583

Significant at 0.035 level (p < 0.05)

Hence the null hypothesis, "Ho15: There will be no significant association between arts and science students in their agreement towards "I abide by guidelines for effective communication and interaction in an online class set by teachers"" is rejected. That means there is a significant association between Stream of study of the respondents and their agreement towards "I abide by guidelines for effective communication and interaction in an online class set by teachers". Both arts and science students significantly differ in their attitude towards complains with guidelines. Arts students more favourable than science students towards guidelines during the online classes.

Table 13**Table 13 Chi-Square Test for Association Between Arts and Science Students in their Agreement Towards "My Academic Performance has Improved Due to Online Tutorials"**

Stream of study of the respondents	My academic performance has improved due to online tutorials.					Total	Pearson Chi-Square		
		Strongly Agree	Agree	Disagree	Strongly disagree		Chi-Square Value	df	Sig.
Arts	5	16	20	9	50				
Science	0	10	26	14	50	8.254	3	0.041	
Total	5	26	46	23	100				

Chi-Square Value: 8.254

Significant at 0.041 level (p < 0.05)

Hence the null hypothesis, "Ho16: There will be no significant association between arts and science students in their agreement towards "My academic performance has improved due to online tutorials"" is rejected. That means there is a significant association between Stream of study of the respondents and their agreement towards "My academic performance has improved due to online tutorials". Both arts and science students significantly differ in their attitude towards improvement in academic performance due to online tutorials. Students from science stream have an unfavourable attitude than arts students towards the improvement in academic performance due to online tutorials.

Table 14**Table 14 Chi-Square Test for Association Between Arts and Science Students in their Agreement Towards "Network Connectivity Never Interferes with Online Classes"**

Stream of study of the respondents	Network connectivity never interferes with online classes.	Total	Pearson Chi-Square

	Strongly Agree	Agree	Disagree	Strongly disagree	Chi-Square Value	df	Sig.
Arts	10	14	24	2	50		
Science	5	15	17	13	50	10.963	3 0.012
Total	15	29	41	15	100		

Chi-Square Value: 10.963

Significant at 0.012 level (p < 0.05)

Hence the null hypothesis, "Ho17: There will be no significant association between arts and science students in their agreement towards "Network connectivity never interferes with online classes"" is rejected. That means there is a significant association between Stream of study of the respondents and their agreement towards "Network connectivity never interferes with online classes".

The students from arts and science stream significantly differ in their attitude towards interfere of network connectivity during online classes. Students from science stream have more disagreement regarding non-interference of network connectivity with online classes.

Table 15**Table 15 Chi-Square Test for Association Between Kerala and Tamil Nadu Students in their Agreement Towards "I have Adequate Infrastructure such as Smartphone, Personal Computer, Internet Connection to Access Online Classes**

Nativity of the respondents	I have adequate infrastructure such as smartphone, Personal computer, internet connection to access online classes	Total			Pearson Chi-Square		
		Disagree	Agree	Strongly Agree	Chi-Square Value	df	Sig.
Kerala	1	30	26	57			
Tamil Nadu	7	26	10	43	10.135	2	0.006
Total	8	56	36	100			

Chi-Square Value: 10.135

Significant at 0.006 level (p < 0.01)

Hence the null hypothesis, "Ho18: There will be no significant association between Kerala and Tamil Nadu students in their agreement towards "I have adequate infrastructure such as smartphone, Personal computer, internet connection to access online classes"" is rejected. That means there is a significant association between Nativity of the respondents and their agreement towards "I have adequate infrastructure such as smartphone, Personal computer, internet connection to access online classes". The postgraduate students from Kerala and Tamil Nadu, significantly differ in their attitude towards infrastructure support for online classes. Students from Kerala show a more favourable attitude towards having adequate infrastructure facilities than students from Tamil Nadu.

FINDINGS AND DISCUSSION

- Majority of the respondents have an unfavourable attitude towards the acceptance of online classes.
- Male respondents are a slightly more unfavourable attitude towards acceptance of online classes than female respondents.
- Mobile phones are the most preferred medium for attending online classes.
- Female respondents are more preferred mobile phones for attending online classes than male respondents.
- Majority of the respondents are everyday internet users.
- The internet usage on male respondents is slightly more than female respondents.
- Most of the respondents who have unfavourable attitudes towards online classes, are everyday internet users.
- Most of the respondents have proper housing facilities.
- Most of the respondents have adequate food to eat at home.

- Most of the respondents have pleasant family atmosphere.
- Majority of the respondents do not feel lonely at home.
- Most of the respondents have proper financial support.
- Length of internet usage is more among male respondents than female respondents.
- Gender of the respondent has no significant influence of their attitude towards Comfortability.
- Female students are more favourable than male students towards the resource provisions during the online classes.
- Gender of the respondent has no significant influence of their attitude towards Technology.
- Respondents stream of study has no significant influence of their attitude towards Comfortability.

CONCLUSION

The Covid-19 Pandemic has an impact on all the sectors in the world including the education sector. The crisis stretches longer and the educational institutions are compelled to follow the guidelines to minimize the crisis risk. The result of this study indicates that there is an unfavourable attitude towards online classes among postgraduate students. Web-oriented learning methods can still exist as an additional method instead of replacing traditional face-to-face learning. The reasons behind this adverse perception among students are less effectiveness, unsatisfied learning environment, network interferences, less understandability, less interaction, etc.

Constantly valued new instructive techniques and better network connectivity furnish the attitude of students towards online classes. Instead of replacing the traditional mode of face-to-face learning, online learning must be wanted to become an additional method of learning. There is a need to understand the barriers that come in the way of acceptance of online classes and take remedial measures to overcome them.

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REFERENCES

Hundekari, J., Mittal, R., Wasnika, S., and Kot, L. (2020). Perception of Equivalence Between Online and Face-To-Face Academic Activities by Undergraduate Medical Students During COVID-19 Pandemic. *International Journal of Scientific Research in Dental and Medical Sciences*, 2(4), 115–120. <https://doi.org/10.30485/ijsrmdms.2020.253310.1091>

Kulal, A., and Nayak, A. (2020). A Study on Perception of Teachers and Students Toward Online Classes in Dakshina Kannada and Udupi District. *Asian Association of Open Universities Journal*, 15(3). <https://doi.org/10.1108/AAOUJ-07-2020-0047>

Kundu, A., and Nath, D. K. (2018). Barriers to Utilizing ICT in Education in India with a Special Focus on Rural Areas. *International Journal of Scientific Research and Reviews*, 7(2), 341–359. <https://doi.org/10.13140/RG.2.2.14437.73449>

Larreamendi-Joerns, J., and Leinhardt, G. (2006). Going the Distance with Online Education. *Review of Educational Research*, 76, 567–605.

Lederer, A. M., Hoban, M. T., Lipson, S. K., Zhou, S., and Eisenberg, D. (2020). More than Inconvenienced: The Unique Needs of U.S. College Students During the COVID-19 Pandemic. *Health Education & Behavior*, 48(1), 14–19. <https://doi.org/10.1177/1090198120969372>

Lee, H.-J., and Rha, I. (2009). Influence of Structure and Interaction on Student Achievement and Satisfaction in Web-Based Distance Learning. *Educational Technology & Society*, 12(4), 372–382.

Maslow, A. H. (1943). A Theory of Human Motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>

National Council for the Social Studies. (n.d.). Wilcoxon Signed-Rank Tests: Procedures and guidelines. https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/PASS/Wilcoxon_Signed-Rank_Tests.pdf

Van Wart, M., Ni, A., Medina, P., Canelon, J., Kordrostami, M., Zhang, J., and Liu, Y. (2020). Integrating students' perspectives about online learning: A hierarchy of factors. *International Journal of Educational Technology in Higher Education*. <https://doi.org/10.1186/s41239-020-00229-8>