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Keywords: *covid 19, online teaching, online examination, offline examination.*

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Analysis of Views of Undergraduate Students towards Online and Offline Mode of Teaching, Learning and Examination

Dr. Kangki Megu [α], Dr. Sukanta Kumar Pradhan [σ] & Dr. Tage Yama [ρ]

Abstract- **The COVID-19 pandemic has set new challenges before the world in all areas including, education, and India is not an exception. The elementary, secondary and higher education system of our country is severely affected with this deadly disease. As such, the schools, colleges and universities have suspended their offline classes throughout the country since March last week of 2020. Amidst these challenges, it has also opened up new opportunities for the teachers, educators, and technocrats, etc. to use online virtual learning strategies for imparting learning experiences to students across the world. Thus, techno-pedagogy is the need of the hour in India and especially in Higher Education. However, the nation is gradually moving towards normalcy, and offline classes have been started by some of the states. Hence, it was necessary to assess how effective online teaching, learning and evaluation in the context of offline teaching, learning and examination. The present paper highlights the views of the undergraduate students on the feasibility of online teaching, learning and examination in the state of Arunachal Pradesh.**

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I. Introduction

Since the very dawn of human civilization, the human race has been facing several epidemics like Cholera, Spanish flu, Plague, Swine Flu, SARS-, Ebola, and the present COVID 19. These highly infectious and contagious diseases have made life miserable, taking thousands of lives of human beings and influenced the social, economic, and educational sectors of the entire world. The Corona virus hurts the global economy and the education realm, and India is not an exception. The elementary, secondary and higher education system of our country is severely affected with this deadly disease. As such the schools, colleges and universities have suspended their classes throughout the country since March last week. According to a report of the Ministry of Human Resource Development, Government of India *(AISSE, 2018)* conducted a survey on higher education and observed that there are 993 universities, 39931 Colleges and 10725 Standalone Institutions listed on their portal, which contribute to education. These institutions further reflect the student density of India as the total enrolments in higher education every year are nearly 37.4 million, reflecting the expanding horizons of the education industry. The sector was seen catching pace by the passing day until Corona virus impacted the country intensely. There is a paradigm shift in the mode of delivery of education system throughout the country both urban and rural. Recently the MHRD and other Apex bodies of different education sectors have issued guidelines to go for virtual mode of teaching from the traditional face to face system of education. This calls for accommodating the changing dynamics in education system by our planners, administrators and practitioners.

II. Origin of the Research Problem

We are living in the world of 21st century. In every Sphere of life technology has been able to deliver tremendous power in the hands of human beings in terms of access, speed, accuracy, precision, control, manipulation and prediction. In the area of agriculture to administration technology is effectively and efficiently used by the people. Education without being an exception has been influenced by technology in terms of its contents, processes and pedagogy. In the words of Alvin Toffler "*The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn*". Digital education is generating new learning opportunities as students engage themselves in online digital environments and as faculties change educational practices through the use of hybrid courses, personalized instruction, new collaboration models and a wide array of innovative and engaging learning strategies. Besides, in 21st century the view of learner's success requires students to not only be thoughtful consumers of digital content, but also effective and collaborative creators of digital media, demonstrating competencies and communicating ideas through dynamic storytelling, data visualization and content creation. Technology in the classroom opens more platforms of delivery of content, introduces new experiences, and creates more opportunities for self-discovery. The present COVID-19 pandemic has set new challenges before the world in all areas including

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education. Amidst these challenges it has also opened up new opportunities for the educators, technocrats etc to use online virtual learning strategies for imparting learning experiences to the students across the world. Thus, techno-pedagogy is the need of the hour in India and especially in Higher Education.

III. Significance of the Study

Arunachal Pradesh is the largest state in terms of area among the north eastern states. The COVID 19 pandemic has influenced the state's education system starting from primary to higher education with respect to its planning, mechanism of delivery and evaluation. The Department of Education, Govt. of Arunachal Pradesh is taking all measures to ensure that education especially higher education should continue amidst this pandemic by stressing on online classes, focus on online examination and evaluation etc. Till the end of July 2020 the spike in COVID 19 cases in the state is in an alarming stage. The UGC issued fresh guidelines that examination of the terminal semester students should be held and this has created confusions among the students fraternity as to how the examinations could be conducted whether offline mode or online mode.

Most of the students studying in colleges of Arunachal Pradesh largely live in rural sector in remote areas which is devoid of internet connectivity. Even though the country and the state have been adapting to the new-age learning, but there are ground realities that obstructs this objective of virtual learning. What still remains intact is that only 45 crore people of our total population of the country have access to the internet and thus to e-learning. The people residing in rural areas are still very much deprived of the latest advancements and therefore hampering the cause of online learning. Now, virtual classrooms are not only dependent on e-lectures but also require one to have access to the e-content and online study material, practice sheets etc. as well. And that's where we lag behind as India is not fully equipped to make education reach all corners of the nation via digital platforms or online classrooms. The students who aren't privileged like the others will be held back due to the current resort and there is no denying that. But universities and the government of India are relentlessly trying to come up with a solution to resolve this problem.

The 21st century is widely acclaimed as the age of super specialization and the age of ICT. The shift from the traditional one to one and face to face mode of learning to the virtual mode of teaching, learning and evaluation is the need of the hour. The COVID 19 pandemic has compelled the educational planners and practitioners to bring changes in the content creation, mode of delivery of the contents and the process of assessing the learning outcomes by the use of technology. Therefore, we have to create adequate resources meant for successful implementation of online teaching, learning and evaluation.

It is being said that an optimist finds opportunity in all difficulties and a pessimist finds difficulty in every opportunities. The pressing need of online education by the central government, state government and affiliated universities cannot be sidelined completely without any valid empirical data. This calls for a detailed study of the views of the stakeholders like the students, teachers, parents etc .This will help us in knowing in exact terms and empirically the feasibility of implementation of online teaching, learning and examination. Realizing the need of the hour the authority of IGG College, Tezu thought it imperative and timely to assign the Department of Education to undertake this piece of research work to provide insights into the workability of the online mode of teaching, learning and evaluation and the issues, challenges and problems supposed to be faced by the students and to derive the probable solutions. The results of the study will provide a sound basis for Planners, Policy makers and Administrators for successful implementation of online mode of teaching, learning and examination in Arunachal Pradesh in particular and India in General.

IV. Statement of the Problem

Keeping in view the above considerations the present study has been entitled as *"Analysis of views of undergraduate students towards online and offline mode of teaching, learning and examination".*

a) Objectives of the Study

The study was undertaken with the following objectives:

1. To study the overall views of the under-graduate students towards online and offline mode of teaching, learning and examination in Arunachal Pradesh.
2. To examine the views of the under-graduate students towards online and offline mode of teaching and learning in Arunachal Pradesh.
3. To examine the views of undergraduate students towards online and offline mode of examination in Arunachal Pradesh.
4. To analyze the views of students on the problems faced during online mode of teaching, learning and examination in Arunachal Pradesh.
5. To suggest and evolve suitable measures for the effective implementation of online mode of teaching, learning and examination.

b) Hypotheses of the Study

In view of the objectives of the study, the following hypotheses were formulated:

1. Undergraduate students don't differ in their views towards online and offline mode of teaching and learning in Arunachal Pradesh.

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2. Undergraduate students don't differ in their views towards online and offline mode of examination in Arunachal Pradesh.

c) Operational Definitions of the Terms Used

The following terms are operationally defined in the present study.

Undergraduate students: All the students who are studying in B.A, BSC and BCOM under the semester system under Rajiv Gandhi University, Itanagar, Arunachal Pradesh.

Online Teaching: It refers to the process of imparting teaching through virtual mode by the use of technology in the synchronous or asynchronous mode.

Online examination: It refers to the process of conducting examination by the use of new software where students can appear examinations online according to their own time, own device regardless of where they live.

V. Methodology and Design of the Study

a) Methodology

For the completion of this piece of research work the investigators adopted the Descriptive- cum-Normative Survey method of research.

b) Population of the Study

All the Under-graduate students of Indira Gandhi Government College, Tezu, Arunachal Pradesh constituted the population of the study.

i. *Selection of Sample*

Data were Collected from a sample of 606 under-graduate students from IGG College, Tezu Arunachal Pradesh. The sample was selected by adopting stratified random sampling technique. Out of 606 undergraduate students 338 were female students and 268 were male students, 472 students were from rural area and 134 students were from urban area and 421 students were from Arts Stream, 76 were from commerce stream and 109 students were from science stream.

ii. *Tools and Techniques Used*

The investigators developed and used the following tools for collecting the required data.

1. A self developed online questionnaire to measure the views of Under-graduate students towards online teaching, learning and examination in Arunachal Pradesh.

The questionnaire was developed comprising different dimensions of online teaching, learning and examination from the perspective of the students. A total number of 30 items were there out of which 29 items were closed ended and one item was open ended.

iii. *Collection of data*

Relevant data were collected from the UG students through online mode by mailing them the questionnaire in their personal registered email address. The questionnaire was prepared using Google Forms.

c) Scope and delimitations of the Study

The scope of the study was delimited to:

1. 606 Under Graduate students of Indira Gandhi Govt College, Tezu Arunachal Pradesh.
2. The variables like Sex, Academic Stream and locality.
3. One self developed online questionnaire.

d) Analysis and Interpretation of Data

The investigator used appropriate statistical techniques feasible for analysis and interpretation of data. The simple percentage analysis was used to analyze and interpret the data.

a. Analysis of views of Undergraduate Students towards Online and Offline Mode of Teaching and Learning:

As it has been stated that the present study was conducted on a sizeable sample of 606 undergraduate students of different streams of Indira Gandhi Government College, Tezu, Arunachal Pradesh, one of the objectives of the present study was to study the views of undergraduate students towards online and offline mode of teaching and learning in Arunachal Pradesh. Hence, the collected data has been analyzed in the following tables:

Table No. 1: Awareness about Online Learning, eLearning and Virtual Learning.

Are you aware of the concept of online learning, e learning and virtual learning	Undergraduate Students	
	Number	Percentage
Yes	277	45.70%
No	173	28.55%
Can't Say	156	25.75%
Total	606	100.00%

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Table No. 2: Frequency of Online Classes attended by the Undergraduate Students.

How many online classes have you attended in the last two months?	Undergraduate Students	
	Number	Percentage
No classes attended	419	69.10%
1-10 classes attended	150	24.80%
More than 10 classes attended	37	6.10%
Total	606	100.00%

Table No. 3: Type of Electronic Device Used at the Time of Online Classes.

Which device did you use at the time of online classes?	Undergraduate Students	
	Number	Percentage
Smart Phones	580	95.70%
Laptops	03	0.50%
Desktops	01	0.20%
Both Laptops and Smart Phones	22	3.60%
Total	606	100.00%

Table No. 4: Online Platforms used by the Teachers during Online Classes.

Which online platforms are used by your teacher during online classes?	Undergraduate Students	
	Number	Percentage
Zoom App	165	27.20%
Google Meet	440	72.60%
Cisco Webex	10	1.70%
Skype	28	4.60%
Total	606	100.00%

Table No. 5: Type of Follow up Teaching Learning Materials Shared after Online Classes.

What kind of materials the teachers share after the online classes?	Undergraduate Students	
	Number	Percentage
PPT Slides	55	9.10%
Online Materials	158	26.10%
Self-Prepared textual Materials	261	43.00%
Sharing Useful Links	132	21.80%
Total	606	100.00%

Table No.6: Usefulness of Online Teaching.

Online teaching increased your:-	Undergraduate Students	
	Number	Percentage
Interpersonal Skills	27	4.50%
Self-learning Ability	303	50.00%
Skill of Using Internet	30	5.00%
None of the Above	246	40.50%
Total	606	100.00%

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Table No. 7: Degree of Assessment of Online Teaching.

How do you rate Online Teaching?	Undergraduate Students	
	Number	Percentage
Very Highly Effective	15	2.50%
Very Effective	34	5.60%
Effective	182	30.00%
Least Effective	222	36.60%
Not at all Effective	153	25.30%
Total	606	100.00%

Table No. 8: Comparison between Online and Offline Teaching and Learning.

Do you think online teaching and learning is better than offline teaching and learning?	Undergraduate Students	
	Number	Percentage
Yes	49	8.00%
No	470	77.60%
Can't Say	87	14.40%
Total	606	100.00%

Table No. 9: Effectiveness of Online Teaching.

Online teaching is very effective as it can be accessed from anywhere at any time and by any person.	Undergraduate Students	
	Number	Percentage
Agree	205	33.80%
Disagree	260	42.90%
Can't Say	141	23.30%
Total	606	100.00%

Table No. 10: Appropriateness of Offline Teaching

Offline teaching is more appropriate than online as it provides the platform of face to face interaction.	Undergraduate Students	
	Number	Percentage
Strongly Agree	313	51.70%
Agree	203	33.50%
Neutral	49	8.10%
Disagree	36	5.90%
Strongly Disagree	5	0.80%
Total	606	100.00%

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Table No. 11: Status of Net Connectivity in Rural Areas of Arunachal Pradesh

Online teaching requires proper net connectivity and most of the students of our State live in rural areas devoid of proper net connectivity.	Undergraduate Students	
	Number	Percentage
Strongly Agree	350	57.80%
Agree	192	31.70%
Neutral	31	5.10%
Disagree	20	3.30%
Strongly Disagree	13	2.10%

Table No. 12: Technical Ability and Knowledge to carry on Online Teaching and Learning

All the teachers and students are not technically efficient to carry on with online teaching and learning.	Undergraduate Students	
	Number	Percentage
Strongly Agree	200	33.00%
Agree	287	47.36%
Neutral	86	14.19%
Disagree	29	4.79%
Strongly Disagree	04	0.66%
Total	606	100.00%

Table No. 13: Cost effectiveness of Online Teaching and Learning

Online teaching and learning require technological devices such as Laptops, Smart Phones which is costly for the students.	Undergraduate Students	
	Number	Percentage
Agree	497	82.00%
Neutral	93	15.30%
Disagree	16	2.70%
Total	606	100.00%

Table No. 14: Requirements of Online Teaching and Learning

Online teaching and learning email Id, WhatsApp number and downloading of several apps like zoom, google meet etc.	Undergraduate Students	
	Number	Percentage
Agree	530	87.50%
Neutral	64	10.50%
Disagree	12	2.00%
Total	606	100.00%

Table No. 15: Problems faced during Online Teaching and Learning

Mention the problems that you have faced during online teaching and learning	Undergraduate Students	
	Number	Percentage
Serious network problem from your side	371	61.20%
Problem of data consumption	58	9.60%
Lack of ability of teachers to teach online	29	4.80%

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Inexperience in handling technological gadgets	40	6.60%
Lack of concentration	108	17.80%
Total	606	100.00%

Table No.16: Perception of Students regarding online Teaching and Academic Achievement.

As a student do you think that online teaching improves your learning and academic achievement?	Undergraduate Students	
	Number	Percentage
Yes, it improves a lot	102	16.80%
No, it does not improve	361	59.60%
No, it is highly ineffective as it does not cater to child psychology	143	23.60%
Total	606	100%

Table No.17: Strategies to make online teaching effective.

How can we make online teaching effective?	Undergraduate Students	
	Number	Percentage
By creating adequate resources and infrastructure	20	3.30%
By imparting proper training to the teachers and students	54	8.90%
By supplying proper network facility in the rural and remote areas	213	35.10%
All the above	319	52.70%
Total	606	100%

b. Analysis of views of Undergraduate students Online and Offline Mode of Examination:

Since one of the objectives of the present study was to study the views of undergraduate students towards online and offline modes of examination, the collected data were analyzed under the following:

Table No. 18: Appearing in online examination

Have you ever experienced appearing in examinations online?	Undergraduate Students	
	Number	Percentage
Yes	85	14.00%
No	498	82.20%
Can't say	23	3.80%
Total	606	100%

Table No.19: Analysis of student's opinion about online examination.

What is your opinion about online examination in a state like Arunachal Pradesh?	Undergraduate Students	
	Number	Percentage
Online examination is a better alternative.	103	17.00%
Offline examination is more effective.	359	59.20%
Online examination should not be imposed.	144	23.80%
Total	606	100%

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Table No. 20: Effectiveness of offline vis-à-vis online examination.

Offline examination is more effective than online examination as it fosters creativity in skill of writing and has clarity in directions of responding.	Undergraduate Students	
	Number	Percentage
Strongly Agree	266	43.90%
Agree	248	40.90%
Neutral	58	9.60%
Disagree	25	4.10%
Strongly Disagree	09	1.50%
Total	606	100.00%

Table No. 21: Feasibility of Online Examination in the state of Arunachal Pradesh

Online examination is not feasible in a state like Arunachal Pradesh because of poor network connectivity.	Undergraduate Students	
	Number	Percentage
Strongly Agree	310	51.20%
Agree	239	39.40%
Neutral	48	7.90%
Disagree	08	1.30%
Strongly Disagree	01	0.20%
Total	606	100.00%

Table No. 22: Online examination and Malpractice.

Online examination will lead to Mass Malpractice and originality of the students could not be assessed properly.	Undergraduate Students	
	Number	Percentage
Strongly Agree	166	27.40%
Agree	300	49.50%
Neutral	122	20.10%
Disagree	14	2.30%
Strongly Disagree	04	0.70%
Total	606	100.00%

Table No. 23: Online examination as an Alternative during Covid-19 Pandemic.

Online examination is a very good alternative to offline examination during and in post covid-19 pandemic.	Undergraduate Students	
	Number	Percentage
Yes	360	59.60%
No	66	10.90%
Can't say	180	29.70%
Total	606	100%

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Table No. 24: Confusion with pattern of questions during online examination.

Most of the students are confused with the pattern of questions of online examination as it has not been mentioned yet by the University.	Undergraduate Students	
	Number	Percentage
Strongly Agree	257	42.40%
Agree	298	49.20%
Neutral	42	6.90%
Disagree	07	1.20%
Strongly Disagree	02	0.30%
Total	606	100.00%

Table No. 25: Opinion of Undergraduate students on the decision of Rajiv Gandhi University, to conduct online teaching, learning and examination.

What is your opinion regarding the decision of the University to conduct online teaching, learning and examination?	Undergraduate Students	
	Number	Percentage
The decision is very pragmatic and practical.	195	32.20%
The decision is impractical and hurried.	103	17.00%
The University authority should rethink on the decision taken.	308	50.80%
Total	606	100%

Table No. 26: Difficulty faced during online filling up examination forms.

Do you find any difficulty during online filling up?	Undergraduate Students	
	Number	Percentage
Yes	397	65.50%
No	182	30.00%
Can't say	27	4.50%
Total	606	100%

Table No. 27: Degree of satisfaction with Online Teaching, Learning and Examination.

How far you are satisfied with the Online Teaching, Learning and Examination?	Undergraduate Students	
	Number	Percentage
Very Satisfied	13	2.10%
Satisfied	208	34.30%
Not Satisfied	385	63.60%
Total	606	100%

Table No. 28: Overall Rating of Online Teaching, Learning and Examination.

How do you rate overall Online Teaching, Learning and Examination?	Undergraduate Students	
	Number	Percentage
Excellent	05	0.80%
Very Good	22	3.60%
Good	191	31.50%
Satisfactory	113	18.60%

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Poor	275	45.50%
Total	606	100.00%

Table No. 29: Suggestions of Students for improvement of online teaching, learning and examination during post-Covid 19 period.

Mention any suggestions for the improvement of present system of online teaching, learning and examination	Undergraduate Students	
	Number	Percentage
The service providers like BSNL, Airtel, Jio, Vodafone etc should ensure provision of proper internet facility in the rural and urban areas on priority basis.	599	98.84%
Govt. should make provision of proper supply of electricity connectivity especially in the rural areas.	595	98.18%
Teachers and students should be properly oriented and made aware regarding the use of technological gadgets and Applications. For this there should be training programmes on online teaching and examination.	575	94.88%
Government should first create minimum infrastructure in terms of ICT components and providing other logistic support before implementation of online teaching, learning and examination.	574	94.71%
Govt should provide one time incentive to all undergraduate students to have smart phones as an ICT incentive to carry out this mode of teaching and learning.	570	94.05%
Teachers should develop need based online teaching learning materials for the students. Examinations should be conducted offline.	497	82.01%

VI. Major Findings of the Study

On the basis of the present online survey and analysis of the data, the following findings of the study are derived.

1. Nearly half of the undergraduate students (45.70%) were aware about online learning, e-learning and virtual learning. However, more than one-fourth (28.50%) of the undergraduate students revealed that they were unaware of online learning, e-learning and virtual learning.
2. Majority (69.10%) of the students could not attend a single class in the last two months during the pandemic period because of poor connectivity/internet facilities. However, nearly one-fourth (24.80%) of undergraduate students had attended between 1- 10 online classes.
3. Almost all the students (95.70%) used smart phones at the time of online classes. Only a meager (3.60%) of undergraduate students used both laptops and smart phones at the time of online classes.
4. Majority (72.60%) of the teachers used Google Meet platform whereas a little more than one-fourth (27.20%) of the teacher used Zoom online platform for the online classes.
5. A little less than half (43.00%) of the teachers shred self-prepared textual materials whereas a little more than one-fourth of the teachers (26.10%) shared online teaching learning materials to the students after the online classes. Besides, a considerable percentage (21.80%), i.e. a little more than one-fifth of the teachers shared useful and relevant links among their students after each online classes.
6. Half (50%) of the students felt that online teaching increased their self-learning ability. However, it is interesting to note that a high percentage of undergraduate students (40.50%) expressed that online teaching did not increase any of the above-mentioned skills and abilities amongst them.
7. Majority (61%) of the undergraduate students felt that online teaching and learning is either least effective or not at all effective for them. However, only (30%) of the undergraduate students revealed that it is effective for them.
8. Majority of undergraduate students (77.60%) felt that online teaching is not better as compared to offline teaching. Only (8.00%) of the undergraduate students said that online teaching is better than offline teaching and learning.
9. Majority (89%) of the undergraduate students either strongly agreed or agreed on the statement that they were devoid of proper net connectivity in their habitations. Only (5%) undergraduate students revealed that they had good net connectivity in their areas.
10. More than (80%) of the undergraduate students were either strongly agreed or agreed on the statement that all the teachers and students are not technically efficient to carry on with online teaching and learning. However, only less than (5%) students were not in favour of the statement.

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11. The undergraduate students found the following problems during online teaching and learning with decreasing frequency of responses.
    i. Serious network problem from student's side.
    ii. Lack of concentration
    iii. Problem of data consumption.
    iv. Inexperience in handling technological gadgets and software.
    v. Lack of ability of teachers to teach online.
12. Majority (59.60%) of Undergraduate students believed that online teaching does not help in improving their learning and academic achievement. It is also interesting to note that nearly one-fourth (23.60%) of the undergraduate students felt that it is highly ineffective as it does not cater to child psychology.
13. Majority (52.70%) of the students felt that all the above steps should be taken like creating adequate resources and infrastructure, imparting proper training to the teachers and students and above all by supplying proper network facility in the rural and remote areas.
14. Majority (59.20%) of undergraduate students felt that offline examination is more effective and nearly one-fourth of them (23.80%) felt that online examination should be imposed on the students.
15. Majority (76%) of the undergraduate students were either strongly agreed or agreed on the statement that online examination will lead to Mass Malpractice and originality of the students could not be assessed properly. It is also interesting to note that one-fifth of the undergraduate students (20.10) remained neutral with regard to this statement showing their apprehension as well.
16. Analysis of degree of satisfaction of undergraduate students regarding online teaching, learning and examination, it is found that majority (63.60%) of the students were not satisfied whereas, only 34.30% of the students were satisfied with online teaching, learning and examination.
17. Majority (45.50%) of the undergraduate students rated online teaching, learning and examination as poor, less than one-fifth (18.60%) of the students rated it as satisfactory and a considerable percentage (31.50%) of undergraduate students rated online teaching, learning and examination as good. However, it is estimated that the overall rating of online teaching, learning and examination was poor.
18. Regarding the perception that online teaching, learning and examination as a supplementary to offline teaching, learning and examination, it is found that majority (52.60%) of undergraduate students did not believe that it can be a supplementary. However, a little less than one-fifth (18.50%) of undergraduate students believed that online teaching, learning and examination is a better supplementary to offline teaching, learning and examination.
19. Regarding the suggestions of students for the improvement of online teaching, learning and Examination in the post Covid 19 period, it was found in order of decreasing frequency of responses as:
    i. The service providers like BSNL, Airtel, Jio, Vodafone etc should ensure provision of proper internet facility in the rural and urban areas on priority basis.
    ii. Govt. should make provision of proper supply of electricity connectivity especially in the rural areas.
    iii. Teachers and students should be properly oriented and made aware regarding the use of technological gadgets and Applications. For this there should be training programmes on online teaching and examination.
    iv. Government should first create minimum infrastructure in terms of ICT components and providing other logistic support before implementation of online teaching, learning and examination.
    v. Govt. should provide one time incentive to all undergraduate students to have smart phones as an ICT incentive to carry out this mode of teaching and learning.
    vi. Teachers should develop need based online teaching learning materials for the students. Examinations should be conducted offline.

VII. Implications of the Study

The present study has implications for the Undergraduate Students, Assistant and Associate Professors at the college level, Principals, University authorities, Policy makers and State Government at large.

The study has implications for the students that they should develop awareness and positive attitude in receiving education through online mode of teaching and learning in the pandemic situation.

The study has implications for the Assistant and Associate Professors that they should adopt online teaching and learning, learn new techniques of imparting virtual learning, use of different platforms like Google meet, Zoom, Cisco webex etc and accept new changes in pedagogy during and in post Covid 19 period.

The Study has implications for the Principals that they should create a techno-friendly environment in the college campus, ensure minimum logistic support to the teaching staff and the students, have liaison and collaboration with district administration and higher authorities and appraise the state government and

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university authorities regarding the basic and emerging needs to cope up with the situation.

The study has implications for the University authorities and State Government that they should have a healthy rapport with the college authorities, sanction additional funds to mitigate the problems, reduce curricular load, and have interaction with all stakeholders before taking any plausible decision specially in conducting online examinations.

The study has implications for the Policy makers that they should evolve new strategies for the successful and smooth carry out of online mode of teaching and learning at the college level, have proper liaison with Apex bodies like the UGC, recommend the state government about the suggestions and recommendations of different stakeholders of higher education and take appropriate and feasible steps for online teaching, learning and examination.

VIII. Conclusion

By and large, online teaching, learning and examination are a new experience to the academia. Although this concept was practically least used before the Covid 19 outbreak throughout the world, it was used as a supplementary to the offline teaching, learning and examination during the pandemic period and continues till today. This has opened new vistas in the field of teaching and learning by providing techno-pedagogical avenues to the teachers to expedite their delivery mechanisms and go beyond the traditional face to face mode of classroom teaching. The present study revealed that online mode of teaching, learning and examination is not a viable approach as the state of Arunachal Pradesh and other Indian States don't have proper electricity and net connectivity. Besides, since lockdown was imposed all of a sudden and there was a transition from face to face mode to Virtual mode suddenly, teachers were also not so much equipped with the technological skills to carry out the same. However, with the limited experiences and able administrative interventions the teachers of this hilly state had surmounted the problems and carried on teaching online and the examination in online – blended mode.

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