DEPARTMENT OF STATISTICS

A

PROJECT REPORT

ON

"Impact of Covid-19 on Education"

BY

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Under the guidance

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ABSTRACT

Covid-19, as a global pandemic, has called for social distancing. It has made people mandatory to sit indoor and sitting idle indoor may lead to mental stress, Hence to keep people engaged and free from mental stress, online learning can play important role. Online learning is the best solution during this pandemic situation. Teachers can use virtual classroom to teach from home with all necessary tools which makes the online sessions as effective as traditional ones. Pandemics often compel the learners to stay at home for long time and obstruct teaching-learning process. This emphasizes on how online learning is beneficial during times of crises like work absences or pandemics.

Keywords: Online Learning, Online Platforms, Perceptions of Learners & Learners & Educators.

INTRODUCTION

Most Government around the world have temporarily closed educational institutions to control the spread of the Covid-19 pandemic. The World Bank is also actively working with ministries of education in several countries in support of their efforts to utilize educational institutions are closed due to Covid-19 pandemic. During this pandemic the education conducted through online. Whole Indian students or the world's students taking education through online platform. We find out the online platform in this pandemic. Teachers have the responsibility to educate each and every student. During this e-learning so many difficulties faced by students and teachers. During lockdown face to face communication is difficult.

OBJECTIVE

- To understand how the covid-19 affected on health.
- To understand how many hours students spend on online lecture.
- To know the problem faced by students during online lecture.
- To study positive and negative influence on students due to online learning.

METHODOLOGY

A questionnaire was developed, which included a variety of multiple-choice questions, Likert scale and for a few questions, the respondents were allowed to enter free texts. The survey was administered using the Google Forms platform, which requires subjects to be logged in to an e-mail account to participate in the survey. The distribution of the questionnaire was conducted through the outreach of social media platforms, e-mail, and standard messaging services. Clear instructions with the google form were provided to ensure the respondent must be a student or teacher.

RESEARCH METHODOLOGY

The survey conducted through google form. The form was circulated through messages and emails. A set of 11- Questionnaire was developed. About 125 responses collected and analysed with the help of statistical tests. The response was collected from age 10-49 students and teachers gave the response. Microsoft excel used to analyse the data. Also R-software was used to analyse the data. After analysing the data interpretation and conclusion performed.

TOOLS USED FOR SURVEY

Survey was made by google form. Survey conducted through the outreach of social media platforms, email, and standard messaging services.

LITERATURE REVIEW

Impact of COVID-19 Pandemic on Teaching and Learning

Sumitra Pokhrel1 and Roshan Chhetri

As of July 2020, 98.6% of learners worldwide were affected by the pandemic, representing 1.725 billion children and youth, from pre-primary to higher education, in 200 countries (United Nations, 2020). Therefore, making learning possible and available from home schooling has been the need of the hour. Pedagogy available and used for face-to-face learning is not feasible for online learning. Though a range of pedagogy has been devised for online and distance learning, teachers who are technologically backward require proper professional development and training in order to orient themselves towards their students Authentic assessments and timely feedback are essential components of learning. A very crucial part of online distance learning is the availability of helpful formative assessments and timely feedback to the online learners (Doucet et al., 2020). This is found to be challenging for the educators and the education system. It is more challenging in the Bhutanese context due to larger class strength, lack of online teaching infrastructure and professional development, and nonparticipative nature of the students.

Maslow before Bloom is the common phrase used in education circles. This

must be the mission for online learning for the continuation of education during the present pandemic. The phrase is typically used to ensure that our students are safe and have their basic needs met before online learning commences. Domestic violence and child abuse are on the rise as the perpetrators are many a time at home or in the neighbourhood, which is a mental distraction and threat to the learners (Ravichandran & Shah, 2020). With students now experiencing home schooling during this COVID-19 pandemic, conducive environment at home for all standards and socio-economic conditions is not uniform. Studies should be carried out to support the hardest hit economically disadvantaged groups. In Bhutan, there are reports of students dropping out or opting to discontinue schooling. This has occurred due to the long break enforced by the school closure during the COVID-19 pandemic. Although no studies are carried out to evaluate the direct impact of the pandemic on dropout rate, a research in this area would bring out the factual details.

There are varieties of online infrastructure that have been prepared by many educational firms and made free for learning during this pandemic. The affordability and accessibility to these online infrastructures for all the learners of varied economic backgrounds are still a challenge.

Students with special needs having learning difficulties, such as hearing impairment, visual impairment and mobility disabilities, require additional training with support and guidance. Many caregivers and parents at home are not able to cater to such needs, hindering the learning of this group of learners. Therefore, there is a need for investing time and resources to explore and research the best alternatives for the special educational needs (SEN) of these learners.

As all students' assignments and examinations are carried out from home, it is challenging for educators to find the authenticity of the work and the actual learning taking place. Moreover, many parents guide and support their children during their learning process, and the extent and degree of support varies greatly. Grading of students is another area of study as no proper criteria are developed and effectively used.

STATISTICAL ANALYSIS

Determination of sample size using Yamen's formula-

Yamen's formula= $\frac{N}{1+N*e^2}$

Where, N=Total population of city and village

e= Degree of precision=0.089

Therefore.

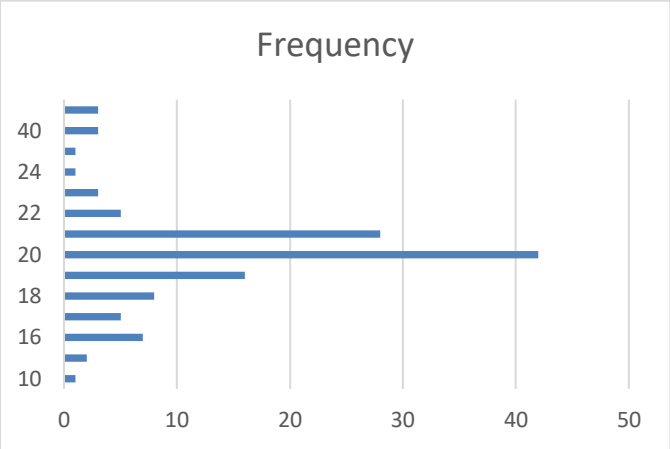
Yamen's formula= $\frac{N}{1+N*e^2}$

$= \frac{10000}{1+10000*0.089^2}$

n =124.6727=125

1)Age analysis-

Age	Frequency
10	1
15	2
16	7
17	5
18	8
19	16
20	42
21	28
22	5
23	3
24	1
28	1
40	3
49	3



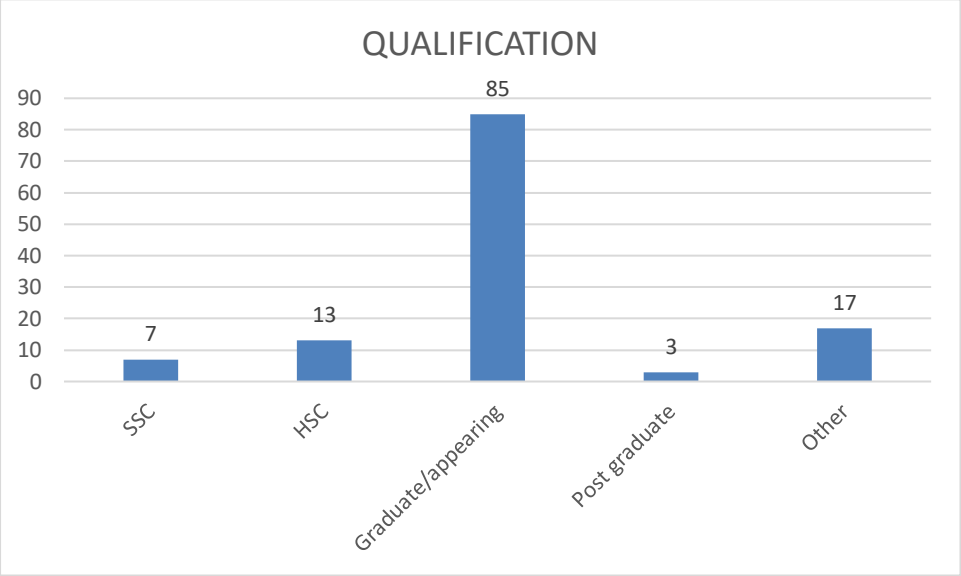

```
> #mode of age
> data=(c(1,2,7,5,8,16,42,28,5,3,1,1,3,3))
> data
 [1]  1  2  7  5  8 16 42 28  5  3  1  1  3  3
> mode=max(data)
> mode
[1] 42
```

Interpretation-

The value of mode is 42 which is maximum. The maximum response is from age 20. The counts of responses of age below 15 and above 30 was minimum as compare to age 20-25.

2) Qualification-

Education	SSC	HSC	Graduate/appearing	Post graduate	Other	Total
Total count	7	13	85	3	17	125



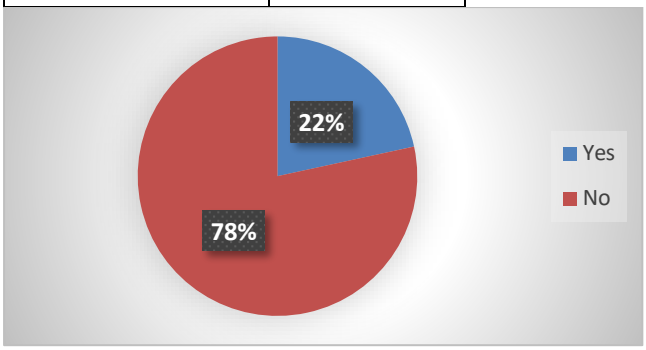
Interpretation-

Students who are in 10th standard and 12th std and college students give response. Maximum number of students are from graduated/appearing. Total 125 response recorded.

1)Have you learned from home

before?

Yes	27
No	98



Interpretation-

98 students didn't learnt from home before. Only 27 students learned from home. About 78% students among 100% learned from school and 27% students learnt online before pandemic.

2)When did you start learning from home?

1month ago	2month ago	3 month ago	more than 3 month ago
68	20	16	13

chi-squared test-

A chi-squared test, also written as $\chi 2$ test, is a statistical hypothesis test that is valid to perform when the test statistic is chi-squared distributed under the null hypothesis, specifically Pearson's chi-squared test and variants thereof. Pearson's chi-squared test is used to determine whether there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories of a contingency table.

Test statistic-

$$\chi^2 = \sum \frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}}$$

Oi=Observed value

Eij=Expected value=N*pi where

N=Total no. of frequency

Pi=probability

$cal\ X^2 > tab\ X^2$ then reject Ho at 5% level of significance.

$cal\ X^2 < tab\ X^2$then accept Ho at 5% level of significance.

Code-

```
> #Ho=There is no significant difference among different age group categories

> #H1=There is significant difference among different age group categories

> data=matrix(c(0,15,0,0,0,16,1,3,0,12,0,2,3,73,0,0),ncol=4,nrow=4)

> m1=chisq.test(data)

In chisq.test(data) : Chi-squared approximation may be incorrect

> m1
```

Pearson's Chi-squared test

data: data

X-squared = 21.176, df = 9, p-value = 0.01189

> m1$expected

[,1] [,2] [,3] [,4]

[1,] 0.36 0.48 0.336 1.824

[2,] 13.92 18.56 12.992 70.528

[3,] 0.12 0.16 0.112 0.608

[4,] 0.60 0.80 0.560 3.040

Months/Age Group	**1 month**	**2 months**	**3 months**	**>3 months**
0-15	0	0	0	3
15-30	15	16	12	73
30-45	0	1	0	0
45-60	0	3	2	0

Interpretation-

Here the p-value is 0.01189<0.05 hence reject Ho at 5% level of significance. There is significant difference between different ages. At age group 15-30, 73 is maximum which is more than 3 months.

3)Do you enjoy learning from home? Do you face any health problem due to online learning?

Que	No	Yes
Do you enjoy learning from home	68	57
Do you face any health problem due to online learning	36	89

The Fisher Exact test is a test of significance that is used in the place of chi square test in 2 by 2 tables, especially in cases of small samples.

The Fisher Exact test uses the following formula:

$$p= ((a + b) ! (c + d) ! (a + c) ! (b + d) !) / a ! b ! c ! d ! N !$$

In this formula, the ‘a,’ ‘b,’ ‘c’ and ‘d’ are the individual frequencies of the 2X2 contingency table, and ‘N’ is the total frequency.

Code-

```
> #Ho=There is no significant difference among different age group categories

> #H1=There is significant difference among different age group categories



> dat =data.frame( "no" = c(68, 36), "yes" =c(57,89), row.names = c("enjoy_learning",
"face_health_issue"), stringsAsFactors = FALSE )

> colnames(dat) <- c("No", "Yes")

> dat

                 No Yes

enjoy_learning    68  57

face_health_issue 36  89

> test=fisher.test(dat)

> test


        Fisher's Exact Test for Count Data



data:  dat

p-value = 6.326e-05

alternative hypothesis: true odds ratio is not equal to 1

95 percent confidence interval:
```

1.693010 5.155352

sample estimates:

odds ratio

2.935961

Interpretation-

The p-value is <0.0001 so reject Ho at 5% level of significance. So there is significant difference between different age group. So many students enjoy learning from home while so many students faced health problem during online learning.

4)Which devices you used for learning from home?

Age	mobile	Laptop/Computer
0-15	3	1
15-30	106	35
30-45	3	2
45-60	3	0
	115	38

Friedman Test:

The Friedman test is a non-parametric statistical test developed by Milton Friedman.Similar to the parametric repeated measures ANOVA,

The procedure involves ranking each row (or block) together, then considering the values of ranks by columns.

Test statistics:

$$Q = \frac{12n}{k(k+1)} \sum_{j=1}^{k} \left(\bar{r}_{\cdot j} - \frac{k+1}{2} \right)^2$$

Code-

```
> #Ho::There is no association between device used and age

> #H1:There is association between device used and age

>

> data=matrix(c(3,106,3,3,1,35,2,0),nrow=4,ncol=2)

> data

     [,1] [,2]

[1,]    3    1

[2,]  106   35

[3,]    3    2

[4,]    3    0

>

> friedman.test(data)


        Friedman rank sum test
```

data: data

Friedman chi-squared = 4, df = 1, p-value = 0.0455

> #reject Ho at 5% level of significance. There is association between device used and age

By using excel-

Age	mobile	Laptop/Computer	Rank	Rank
0-15	3	1	2	1
15-30	106	35	2	1
30-45	3	2	2	1
45-60	3	0	2	1
	115	38		

mean rank	mean rank
2	1

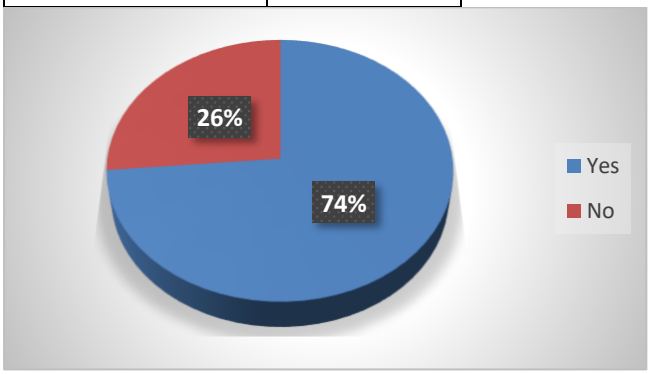
N	4
chisq	4
df	1
p value	0.0455

Interpretation-

The p-value is less than 0.05 so reject Ho at 5% level of significance so there is association between device used and age. They prefer to use device mobile than any other device. Age group 15-30 used maximum number of devices while learning online. 106 students use mobile for learning while other used laptop/computer.

5)Do you have suitable study place?

Yes	92
No	33



Interpretation:

Here about 92 students have suitable place to study about 74% from 100% have suitable study place while 33 means 26% students do not have study place.

6)How many hours you gave for learning from home?

Hours/Age	1 hour	2 hours	3 hours	>3 hours
0-15	1	2	0	0
15-30	6	32	49	29
30-45	3	1	0	0
45-60	2	0	0	0

A chi-squared test, also written as $\chi 2$ test, is a statistical hypothesis test that is valid to perform when the test statistic is chi-squared distributed under the null hypothesis, specifically Pearson's chi-squared test and variants thereof. Pearson's chi-squared test is used to determine whether there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories of a contingency table.

Test statistic-

$$\chi^2 = \sum \frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}}$$

Oi=Observed value

Eij=Expected value=N*pi where

N=Total no. of frequency

Pi=probability

$cal\ X^2 > tab\ X^2$ then reject Ho at 5% level of significance.

$cal\ X^2 < tab\ X^2$then accept Ho at 5% level of significance.

Code-

```
> #Ho:there is no significant differences between ages

> #H1: there is significant difference between different ages

> data=matrix(c(1,6,3,2,2,32,1,0,0,49,0,0,0,29,0,0),nrow=4,ncol=4)

> m1=chisq.test(data)

In chisq.test(data) : Chi-squared approximation may be incorrect

> m1


        Pearson's Chi-squared test


data:  data

X-squared = 47.209, df = 9, p-value = 3.587e-07


> m1$expected

      [,1]  [,2]   [,3]   [,4]

[1,]  0.288  0.84  1.176  0.696

[2,] 11.136 32.48 45.472 26.912

[3,]  0.384  1.12  1.568  0.928

[4,]  0.192  0.56  0.784  0.464
```

> #p<0.0001 reject Ho at 5% level pf significance

Interpretation-

Here p<0.0001 reject Ho at 5% level pf significance. There is no significant differences between ages. At age group 15-30 so many students learn for about 1 to more than 3 hours. Average learning hours is 2.5 hours daily they spent on learning from home.

7)What do you prefer among the following?

Age group	learning from home	learning from school
0-15	0	3
15-30	33	83
30-45	0	3
45-60	1	2

A popular nonparametric test to compare outcomes between two independent groups is the Mann Whitney U test. The Mann Whitney U test, sometimes called the Mann Whitney Wilcoxon Test or the Wilcoxon Rank Sum Test, is used to test whether two samples are likely to derive from the same population (i.e., that the two populations have the same shape). Some investigators interpret this test as comparing the medians between the two populations. Recall that the parametric test compares the means (H0: $\mu 1=\mu 2$) between independent groups.

Test statistics-

The test statistic for the Mann Whitney U Test is denoted U and is the smaller of U1 and U2, defined below.

$$U_1 = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

$$U_2 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

Hypothesis-

Ho:there is no significant differences between ages and learning method used.

H1: there is significant difference between different ages and learning method used.

By using excel-

Xi	Rank
0	1.5
0	1.5
1	3
2	4
3	5.5
3	5.5
33	7
83	8

n1=4

n2=4

R1=13, R2=23

U1=11

U2=1

CalU=1

TabU=0

CalU>TabU

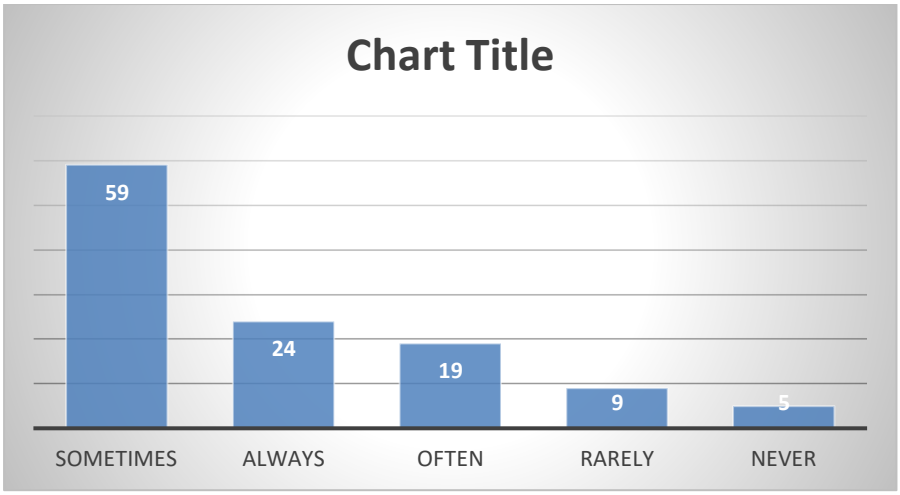
accept Ho at 5% los

Interpretation-

There is no significant difference between different ages and method of learning used. So many respondent like to learn from home about 83 responses recorded. And other wants to learn from home.

8)Have you established a good learn routine?

Sometimes	59	51%
Always	24	21%
Often	19	16%
Rarely	9	8%
Never	5	4%



Interpretation:

Here the maximum percentage is for who has good routine about 51% which is maximum as compare to others. The number of students who do not have good routine is 5. And who has always is 24.

9)What problem you had faced during learning from home?

Problems	0-15	15-30	30-45	45-60
Network issues	1	97	3	3
Disturbance due to surrounding	1	60	1	1
Less place	0	17	0	0
Lack of interest	0	31	0	0
Distracted easily	0	37	0	2
Lack of communication	0	35	0	3

Kruskal–Wallis test-

The Kruskal–Wallis test by ranks, Kruskal–Wallis H test (named after William Kruskal and W. Allen Wallis), or one-way ANOVA on ranks is a non-parametric method for testing whether samples originate from the same distribution. It is used for comparing two or more independent samples of equal or different sample sizes.

Test statistics:

If the data contain no ties the denominator of the expression for

$H=\frac{12}{N*(N+1)}\sum_{i=1}^{g} niri^2 - 3(N+1)$

Hypothesis-

Ho: There is no significant differences between ages and problem faced.

H1: there is significant difference between different ages and problem faced.

By using excel-

Ranks

1	4	2.5	2.5
2	1	2	2
2	1	2	2
2	1	2	2
1.5	4	1.5	3
1.5	4	1.5	3

Total	10	15	11.5	14.5	
count	6	6	6	6	
n*r^2	600	1350	793.5	1261.5	4005
K	5.1				
chi sq	7.814727903				
p-value	0.164619404				

Result: p>0.05, then accept Ho at 5% level of significance.

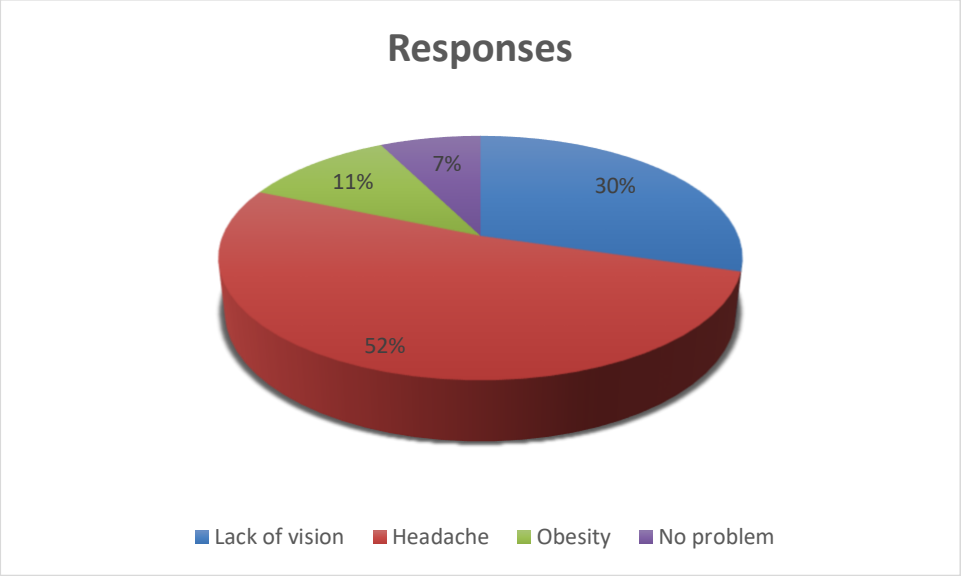
Interpretation-

The value of p is 0.1646 which is greater than 0.05 then we accept Ho at 5% level of significance. So there is no significant differences between ages and problem faced.

Maximum problem faced by age group 15-30. About 97 students faced problem during online lecture the problem is network issues.

10)Which health problems you had faced during learning from home?

Problems	Responses	Percentage
Lack of vision	48	30%
Headache	84	52%
Obesity	18	11%
No problem	12	7%
Total	162	100%



Interpretation-

The maximum no. of students suffered from headache. About 52% students going through this problem. Then about 30 % students suffered from lack of vision due to the brightness of mobile/laptop. And 7% students hadn't faced any health issues.

LIMITATIONS

There are some limitations to our study that should be noted. The first limitation is the sampling technique used. It relies on digital infrastructure and voluntary participation that increases selection bias. The imposed travel restrictions limited the outreach to students who do not have access to online learning. Second, the study is obtained from one specific area, given the lockdown orders and the online medium of classes, we expect these results to be fairly generalizable for schools and universities nationwide. Another limitation of this study is the cross-sectional design of the survey, there was no follow-up period for the participants.

SUGGESTIONS

- Students had to understand the situation and make it as a habit to learnt from home.
- If we were not able to go to school it is indeed to study from home. And tried to find out the better opportunities in future.
- For having better carrier we can take suggestions from teachers, parents etc., We have to take care of our health while learning online.

FINDINGS AND CONCLUSIONS

In this study, our findings indicated that the Covid-19 outbreak has made a significant impact on the health, education, and daily routine of students. The Covid-19 related interruptions highlight key challenges and provide an opportunity to further evaluate alternate measures in the education sector. The new policies and guidelines in this direction would help mitigate some of the negative effects and prepare educators and students for the future health crisis.

So many students faced health issues like headache, maximum number of students used mobile phone while learning from home. They spent about 3 or more hours while learning from home. They faced network issues while learning from home.

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   https://www.sciencedirect.com/science/article/pii/S019074092032288X#t0025

2. A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. Sumitra Pokhrel and Roshan Chhetri.

ANNEXURE

1. When did you start learning from home?

   1)One month ago 2) Two months ago 3) 3 months ago 4) more than 3 months ago

2. Have you learned from home before?

   1) Yes

   2) No

3. What problems you had faced during learning from home?

   1) Network issues

   2) Disturbances due to surrounding

   3) Less place

   4) Lack of interest

   5) Distracted easily

   6) Lack of communication with others

4. Which devices you used for learning from home?

   1) mobile

   2) Laptop/Computer

5. Do you have suitable study place?

   1)Yes

   2)No

6. How many hours you gave for learning from home?

   1)1 hour

   2)2 Hours

   3)3 Hours

4) more than 3 hours

7. Have you established a good learn routine?
    1) Always
    2) Often
    3) Sometimes
    4) Rarely
    5) Never
8. What do you prefer among the following?
    1) Learning from home
    2) Learning from college
9. Do you face any health problems due to learning from home?
    1) Yes
    2) No
10. Which health problems you had faced during learning from home?

    1)Lack of vision

    2) Headache

    3) Obesity

    4)Other
11. Do you enjoy learning from home?
    1) Yes
    2) No

Thank you