Effectiveness of Online Learning during the COVID -19 Pandemic in Mizoram

L.P. Lalduhawma[1]
L. Thangmawia[2]
Jamal Hussain[3]

(✉ Corresponding Author)

[1,2]*Department of Mathematics, Pachhunga University College, Aizawl, India.*
[1]*Email: lpduhawmaa@yahoo.com*
[2]*Email: tmalangel@gmail.com*
[3]*Department of Mathematics and Computer Science, Mizoram University, Tanhril, India.*
[3]*Email: jamal.mzu@gmail.com*

Abstract

Due to the outbreak of Covid-19 pandemic, most schools in Mizoram shifted to online learning platforms to continue with their academic activities. A survey was carried out using a questionnaire to identify the effectiveness of online learning. 356 students and 60 teachers from different secondary and higher secondary schools in Mizoram responded to this survey. To find the effectiveness of online learning, percentages were calculated to analyze the data and the mathematical consensus (*Cns*) were calculated. Students' preferences and perceptions on various attributes of online classes were analyzed. The results indicated that most of the students and teachers were not quite ready to shift to online learning platforms. Bad internet connectivity, low data limits, slow data speed, demand for costly devices such as smart phones and related software and connectivity were problems faced in conducting online classes. It was found that the students preferred using smart phones to follow online classes, and mathematics was the most difficult subject to learn or teach in online classes.

Keywords: Online learning, Consensus, Mean, Perception, Preferences, Mizoram.

Contents

Contribution of this paper to the literature
This paper studied the effectiveness of online learning in schools in Mizoram state situated in a remote part of India. Due to its remoteness, online learning is a great challenge in Mizoram.

1. Introduction

Mizoram is the land of the Mizo people, a north eastern state of India lying between Myanmar and Bangladesh. Aizawl is the capital city of Mizoram and there are eleven districts in this state. The state covers 21,081 square kilometers of land area. According to the 2011 census, the state population was around eleven lakhs (1.1 million) and the literacy rate was around 91%. The outbreak of Covid-19 pandemic has been a major problem in Mizoram. To minimize the spread of Covid-19, the education institutions in Mizoram made the transition to online teaching and learning soon after the first Covid-19 pandemic lockdown. The online education affected the quality of the education system, student's comprehension of lessons and teaching quality of the teachers.

In the beginning of February 2020, China closed her education institutions due to the rising pandemic. In mid-March, almost eighty countries around the world announced the closure of their education institutions. By the end of April 2020, one hundred and eighty six countries had closed down their education institutions, affecting about 1.3 billion enrolled learners (UNESCO, 2020). In India a nation-wide lockdown for twenty one days started from 25th March 2020, which was later extended for nineteen days. In Mizoram, the private institutions started their online learning sessions soon after the lockdown, even before the announcement was made by the government. The main aim of this study was to investigate the quality of online teaching and learning practiced during the pandemic lockdown in the state of Mizoram. Online education had never been practiced before and it was a massive experiment for this state. The effectiveness of online learning depends on the online environment as well as understanding and addressing constraints faced by the students and teachers. This study examined the perceptions of Mizoram state higher and secondary school students and teachers and various other attributes which could make online teaching and learning more effective and fruitful. In secondary level education, the syllabuses include Major Indian languages, English, Science, Social Science and Mathematics; in higher secondary education, students are divided into three streams, namely Arts, Commerce and Science. The results of this study may be important for the Mizoram state as well as for the rest of the world because most educational institutions did not have much time to design and adapt their course contents for online teaching and learning, to enable the experiences of teachers and students to be incorporated into online learning, to make the process easy and more effective. There was uncertainty about the length of the pandemic and chances of second waves and third waves surfacing, so the education authorities modified the course structures to fit e-learning platforms.

2. Literature Survey

The advancement of technology brings new types of online content for teaching and learning. The preferences and perceptions of learners and teachers are very important to make online learning and teaching effective and productive. Warner, Christie and Choy (1998) proposed the concept of readiness for online learning in the Australian vocational educational and training sector. Smith, Murphy and Mahoney (2003) conducted an exploratory study for online readiness and came up with two factors: 'Comfort with e-learning' and 'Self-management of e- learning'. Luaran, Samsuri, Nadzri and Rom (2014) studied the students' perspectives on the effectiveness of using e-learning among secondary school students in Kuala Lumpur. Muthuprasad, Aiswarya, Aditya and Jha (2021) investigated the students' perceptions and preferences for online education in India during the Covid-19 pandemic. Rafique, Mahmood, Warraich and Rehman (2021) studied the readiness for online learning during the Covid-19 pandemic among the library and information science students in Pakistan. The factors of readiness for online learning and motivation and learning with computer and internet are explored in the following research papers by Gunawardena and Zittle (1997); Lin and Hsieh (2001); Deci and Ryan (1985); Ryan and Deci (2000); Frankola (2001); Hung, Chou, Chen and Own (2010); Bignoux and Sund (2018). Several studies reveal that the instructor's interaction with students has considerable impact on the student's perceptions of online learning. Cereijo, Young and Wilhelm (1999) investigated the factors facilitating learner participation in asynchronous Web-based courses and Swan et al. (2000) studied the consistency of course designs. The teacher's interaction with students also has a considerable impact on the students' perceptions of online learning. Arbaugh (2000) studied how classroom environment and student engagement affected learning in internet based Master of Business Administration (MBA) courses. Sun and Chen (2016) studied how effective online classes depended on well-structured course content, well prepared instructors and advanced technologies. Pandey et al. (2022) recommended online teaching during the Covid-19 pandemic but concluded that satisfaction with online learning is significantly dependent on the teaching method and attitudes of teachers and lecturers towards delivering online lessons. Studies related to online learning are found in the research papers by Petrides (2002); Wagner, Werner, and Schramm (2002); Vonderwell (2003); Woods Jr (2002); Kim, Liu, and Bonk (2005); Piccoli, Ahmad, and Ives (2001); Song, Singleton, Hill, and Koh (2004); Shahzad, Hassan, Aremu, Hussain and Lodhi (2021).

3. Data Analysis and Methodology

For this study, the respondents were chosen from different parts of Mizoram. 356 students and 60 teachers were selected from different higher and secondary schools in Mizoram. Among them, 230 were secondary school students and 126 were higher secondary school students, with 239 male and 117 female students. Among the teachers, 38 were males and 22 were females, with 2 graduate and 58 post- graduate students. In the year 2020 in Mizoram, the education institutions were closed due to the pandemic lockdown, beginning from March 2020. The lockdown eased slowly and face-to-face classroom teaching was partially carried out in the following year, 2021. During that time a preliminary questionnaire was designed with the help of literature survey and informal discussion with the students and teachers who had experience in online learning and teaching printed questionnaires were distributed to both government and private-owned institutions where students attended online classes.

Data were collected on demographic features of the respondents, the teachers' and students' preferences and perceptions, benefits and drawbacks and constraints and suggestions. The statements in the questionnaires were designed based on the literature survey and discussions with students, teachers and experts. The percentages were calculated to analyze the data and the mathematical consensus (Cns) were calculated using the following formula (Tastle & Wierman, 2007).

$$Cns(X) = 1 + \sum_{i=1}^{n} p_i \, log_2 \left(1 - \frac{|X_i - \mu_X|}{d_X} \right)$$

In this formula X_i is likert attributes, p_i is probability associated with X_i, d_X is width of X, μ_X is mean of X_i and i ranges from 1 to 5.

The mean of the five points continuum scale is also calculated based on the following formula:

$$\mu_X = \sum_{i=1}^{n} p_i \, X_i$$

The mirror image of consensus is dissension (Dnt) and the standard deviations always increase as dissension increases. It has the following form (Tastle & Wierman, 2007):

$$Dnt(X) = - \sum_{i=1}^{n} p_i \, log_2 \left(1 - \frac{|X_i - \mu_X|}{d_X} \right)$$

The dissension is always one minus consensus, i.e. $Dnt(X) = 1 - Cns(X)$.

In the five point continuum scale (likert scale), the number of individuals participating in the group does not have any impact on the value of the consensus. The shift of one person from strongly agree to strongly disagree causes the balance to shift slightly towards the strongly disagree on the likert scale. When participants in the group shift to neutral, the degree of consensus increases. Hence the degree of proximity increases as the number of individuals in the group adjusts their perceptions about the statement under discussion and move towards or away from the agreement. The increase in the number of participants does not affect the consensus measure. Regardless of the number of participants, the proportion of the group in each category is constant and the measure of consensus remains unchanged (Tastle and Wierman, 2007).

4. Results and Findings of Study
The analysis of the data is as follows:

4.1 Demographics of Respondents
The demographic variables include degree (degree refers to the Level of Education in the case of students; and Educational Qualification in the case of teachers), age, sex, place of residence and district. The mean age of students was 18 years and 41.45 years for teachers. Among the students, 64.6% were higher secondary school students and 35.4% were secondary school students; there were 96.6% post graduate teachers. The percentage of male students was 67.1 and female students comprised 32.9%. As for teachers, 63.3% were males and 36.7% were females. There were 73.3% of students living in urban areas and 26.7% living in rural areas, while all the teachers were from the city area (see Table 1).

Table 1. Demographic details of respondents.

Students	Item	Nos.	Teachers	Item	Nos.
Degree	Higher Sec. School	230	Degree	Graduate	2
	High School	126		Post Graduate	58
	Total	356		Total	60
Sex	Male	239	Sex	Male	38
	Female	117		Female	22
Residence	Rural	95	Residence	Rural	0
	Urban	261		Urban	60
Age group	$10-15$	4	Age group	$26-35$	24
	$16-20$	348		$36-45$	14
	$21-25$	4		$46-60$	22
District	Aizawl	275	District	Aizawl	60
	Others	81		Others	0

4.2. Basic Information on Online Classes
Among the students in the study sample, 86.2% had experience in attending online classes and 73.3% of teachers had prior online teaching experience. Some private schools started online classes just after the first covid-19 pandemic lockdown; they comprised 26.6% of the overall number of students and teachers. Many of the students (77.8%) attended online classes less than 10 times a week and 76.6% attended online mathematics classes less than 5 times a week while 73.3% of teachers conducted online classes less than 10 times and online mathematics classes less than 5 times a week. During the pandemic lockdown, 26.7% of the students wanted teachers to provide only assignments and reading materials, 41.3% wanted to suspend the curriculum and 32% wanted to manage with online classes. Among teachers, 26.6% wanted to provide only assignments and reading materials, 10% wanted to reduce the syllabus and 63.4% wanted to manage with online classes during this pandemic. Most of the students (62.9%) and teachers (76.6%) opined that Mathematics was the most difficult subject to teach and understand in online classes. During the Covid 19 pandemic lockdown, the teaching videos of different subjects were broadcasted throughout Mizoram. Only 14% of the students thought that this broadcasting was helpful while 50% of the teachers thought it was good. Basic information on online classes is seen in Table 2; the s- inside parenthesis indicates students and t indicates the teachers in the study.

Table 2. Basic information on online classes.

Questions	Response	Nos.
Do you have any experience in attending or conducting online classes?	Yes	307(s), 44(t)
	No	49(s), 16(t)
Did your institution begin online classes during the first Covid 19 lockdown?	Yes	94(s), 16(t)
	No	262(s), 44(t)
How many online classes were conducted in a week?	Less than ten	277(s), 44(t)
	Ten to twenty online class	72(s), 14(t)
	More than twenty	7(s), 2(t)
How many online Mathematics classes were conducted in a week?	Less than five	273(s), 44(t)
	Five to ten online class	79(s), 14(t)
	More than ten	4(s), 2(t)
What measures will you suggest for the education system during the Covid 19 pandemic lockdown?	Providing assignments and reading materials	95(s), 16(t)
	Suspending the curriculum scheduled	147(s), 6(t)
	Managing with online classes	114(s), 38(t)
Which subject is most difficult to teach /study in online classes?	Mathematics	244(s), 46(t)
	Science	96(s), 12(t)
	languages	16(s), 2(t)
Is broadcasting lectures over the local TV channels during the pandemic helpful?	Yes	50(s), 30(t)
	No	217(s), 18(t)
	No idea	89(s), 12(t)

Note: s- students and t – teachers.

4.3. Technical Requirements for Online Class

The devices preferred by the respondents when attending or conducting lectures in online classes were Smart phones (54.2% students and 23.3% teachers), Laptops (38.7% students and 60% teachers), Tablets (2.2% students and 6.6% teachers); Desktops were chosen by the rest. In providing class updates, 95.5% of the students and 93.3% of teachers chose Whatsapp, as it is the most common means of communication used by the people of Mizoram. The most common source of internet among the teachers and students was the mobile data pack, at 66.6% and 63.7% respectively. Google meet, Google classroom and Zoom were the most common soft-wares used for online classes. The preferred software for attending and conducting lectures online were zoom and Google classroom; 53.3% of students chose zoom and 36.6% of teachers chose Google classroom. The details of the technical requirements for online classes are seen in Table 3.

Table 3. Technical requirements for online classes.

Attributes	Response	Nos.	Response	Nos.
Preferred device for online classes	Smart phone	193(s), 14(t)	Tablet	8(s), 4(t)
	Laptop	138(s), 36(t)	Desktop	17(s), 6(t)
Means of communication for class updates	Whatsapp	340(s), 46(t)	Others	16(s), 4(t)
Main source of internet	Mobile data pack	227(s), 40(t)	Others	129(s), 20(t)
Preferred software for online classes	Google meet	80(s), 12(t)	Google classroom	33(s), 22(t)
	Zoom	197(s), 16(t)	Others	46(s), 10(t)

Note: s- students and t – teachers.

4.4. Structure of Online Classes

The preferences of teachers and students for the structure of online classes are seen in Table 4. 35.6% of the students and 50% of the teachers preferred live online classes. 19.3% of students and 10% of teachers chose recordable live online classes. 31.1% of students and 26.6% of teachers wished to upload the recorded online classes into the internet sites and the rest of the teachers and students preferred just sending out the teaching and reading materials. For the course materials, 75% of the students and 80% of teachers liked video contents with reading materials. Among the students, 11.23% liked PowerPoint presentations for their video content materials, 12.9% liked white board presentations, 35.1% liked both PowerPoint and white board presentations and the rest felt it should fit convenience and requirements. Among the teachers, in video content materials, 40% liked PowerPoint and white board presentations, 36% left it to convenience and requirement and 16.6% liked only white board presentations while the rest of the few liked PowerPoint presentations only.

The frequency and duration of online classes are shown in Table 4. Around 15.4% of students and 23.3% of teachers wanted online classes every day. 45.7% of students and 40% of teachers liked as per scheduled to complete the syllabus. 31.4% of students and 46.6% of teachers preferred the duration of online classes at 30 minutes per session while 38.4% of students and 33.3% of teachers preferred 45- minute lessons. The duration of break between two consecutive online classes was preferred at 15 minutes by 41.2% of the students and 80% of teachers. Around 50.5% of students and 63.3% of teachers thought that technical training was necessary for online classes and 59.3% of students and 73.3% of teachers needed privacy to attend and deliver online lessons (see Table 4).

Table 4. Structure of online classes.

Attributes	Response	Nos.
Online class format	Live online classes	127(s), 30(t)
	Live online classes that can be recorded	69(s), 6(t)
	Recorded classes that are uploaded in the internet sites	111(s), 16(t)
	Sending reading/teaching materials	49(s), 8(t)
Nature of course material	Reading material is sufficient	52(s), 8(t)
	Video content with reading material	269(s), 48(t)
	Video content is sufficient	35(s), 4(t)
Nature of video content	PowerPoint presentation	40(s), 4(t)
	White board presentation	46(s), 10(t)
	Both power point and white board presentations	125(s), 24(t)
	As per convenience and requirement	145(s), 22(t)
Frequency of online classes conducted by each of the course instructors	Daily	55(s), 14(t)
	Alternate days	87(s), 14(t)
	Once a week	26(s), 6(t)
	Twice a week	25(s), 2(t)
	As per the schedule to complete the syllabus	163(s), 24(t)
Duration of online classes (per class)	30 minutes	112(s), 28(t)
	45 minutes	137(s), 20(t)
	1 hour	78(s), 12(t)
	More than 1 hour	29(s), 0(t)
Time needed for a break between two online classes	Less than 10 munities	14(s), 0(t)
	10 minutes	61(s), 10(t)
	15 minutes	147(s), 48(t)
	More than 15 minutes	134(s), 2(t)
What do you think of technical training for online classes?	Necessity	180(s), 38(t)
	Not a necessity	176(s), 22(t)
Do you think that privacy is necessary to attend online classes?	Necessity	211(s), 44(t)
	Not a necessity	145(s), 16(t)

Note: s– students and t – teachers.

4.5 Development in Conducting Online Classes

The various means of communication used for communication in online education are as follows: whatsapp was preferred by 36.7% of students and 40% of teachers, while 14% of students and 26.6% of teachers preferred separate platforms for posting comments and answers. 54.2% of students expected their instructors to clarify their doubts within a short period of time while in reality only 46.6% of teachers responded early to students' queries. 28.9% of students and 40% of teachers chose to have their enquiries answered within a day. Around 83.3% of teachers and 62.3% of students preferred to ask questions during online classes and 57.5% students and 80% of teachers preferred giving assignments at the end of online classes. 46% of the students and 90% of teachers thought that online exams were not fair while 29.2% of students and 10% of teachers had no idea about online exams. Around 61.5% of students and 46.6% of teachers preferred online exams to be solely objective in nature while 33.7% of students and 53.4% of teachers preferred objective as well as descriptive or subjective type questions. The details of development in online classes can be seen in Table 5.

Table 5. Development in online classes.

Attributes	Response	Nos.
Ways of clarifying enquiries	Using live chat and email	16(s), 0(t)
	Creating platforms for posting enquiries	50(s), 16(t)
	Direct contact with course instructor	31(s), 10(t)
	Using whatsapp	131(s), 24(t)
	All of the above	128(s), 10(t)
Expected time for clarifying inquiries	Within a few hours	193(s), 28(t)
	Within a day	103(s), 24(t)
	Within a week	19(s), 2(t)
	Before the next class	41(s), 6(t)
Do you like quizzes to be held at the end of each online class for better learning outcomes?	Yes	222(s), 50(t)
	No	134(s), 10(t)
Do you like assignments to be given at the end of each class?	Yes	205(s), 48(t)
	No	151(s), 12(t)
How do you feel about online exams?	It will not be fair	164(s), 54(t)
	It will be fair enough	88(s), 0(t)
	I have no idea	104(s), 6(t)
Nature of online exams	Objective only	219(s), 28(t)
	Subjective only	17(s), 0(t)
	Both Objective and Subjective	120(s), 32(t)

Note: s– students and t – teachers.

4.6. Perceptions of Respondents on Online Classes

The frequencies of ten statements rated on a five point continuum scale are shown in Tables 6 and 7, for both students and teachers. Around 62% of students and 56.6% of teachers do not believe that it is possible for online courses to achieve similar learning outcomes as classroom courses. 62.3% students and 56.6% teachers do not think that online courses can help in the comprehension of course materials as compared with classroom teaching. 58.4% of students and 56.6% of teachers think that online mathematics classes are inconvenient and difficult to comprehend compared with other subjects. Local television broadcast teaching is not seen to be effective when compared with online teaching, according to 69.6% of students and 53.3% of teachers. Furthermore, online classes are not helpful to poor people as they face many problems in acquiring the required tools, based on the opinion of 60.6% of students and 56.6% of teachers (see Table 6 & Table 7).

Table 6. Students' opinions of online classes.

Statements	1	2	3	4	5	Mean	Cns	Dnt
1. It is not possible to structure online classes along the same lines as classrooms	93	128	64	52	19	2.37	0.55	0.45
2. Online classes can help students to comprehend the lesson materials just as in classroom learning	70	152	71	40	23	2.42	0.58	0.42
3. It is easier to communicate with instructors online than in the classroom	78	85	84	56	53	2.77	0.46	0.54
4. Participating in online lessons is easier than participating in classroom lessons	87	68	76	70	55	2.82	0.43	0.57
5. Technical skills can be increased by attending online classes	62	57	77	96	64	3.12	0.46	0.54
6. It is important for instructors to be more effective during online teaching compared with classroom teaching	66	68	72	90	60	3.02	0.46	0.54
7. Students' attention is more important for successful online learning than classroom learning	59	84	86	73	54	2.94	0.49	0.51
8. It is more convenient to learn mathematics online compared with other subjects	115	93	57	36	55	2.50	0.41	0.59
9. Learning through local television broadcasts is better than learning online	151	97	51	37	20	2.09	0.53	0.47
10. In spite of costly materials, online classes are helpful for poor students	134	82	51	41	48	2.40	0.40	0.60

Note: Learning is associated with students and teaching is associated with teachers.
Where, 1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree.

Tables 6 and 7 show that the consensus varied between 0.40 and 0.58 among students and 0.44 to 0.62 among teachers, which implies that there was neither perfect agreement nor perfect disagreement between the respondents regarding the effectiveness of online teaching and learning (see Muthuprasad et al., 2021).

4.7. Advantages and Disadvantages of Online Classes

The perceptions of the participants on distractions, technological constraints, environments, learners, instructors and economic issues which are seen as challenges faced in online learning are analyzed in this study. The results show that most of the teachers (93.3%) face problems with network connectivity while 90% and 86.6% of teachers face problems with data limit and speed respectively. Lack of face to face interaction is a problem for 83.3% of teachers and 66.6% lack a good learning environment. 86.6% of teachers feel that students in online classes need more self-discipline and 56.6% of the students and teachers feel that online classes improve technical skills. Additionally, 71.6%, 66.2% and 67.4% of students have no problems in the network connectivity, data limit and data speed respectively. And the requirement of self-discipline is thought to be high for online classes by 60.6% of students. The details of the benefits and drawbacks of online classes as perceived by teachers and students are shown in Tables 8 and 9 respectively.

Table 7. Teachers' opinion of online classes.

Statements	1	2	3	4	5	Mean	Cns	Dnt
1. It is possible to structure online courses along the same lines as classroom courses	8	26	4	12	10	2.83	0.44	0.56
2. Online courses help in the comprehension of course materials just as well as in classroom learning	4	30	6	18	2	2.73	0.58	0.42
3. It is easier to communicate with students online than in classrooms	16	18	16	6	4	2.40	0.66	0.44
4. Conducting online lessons is easier than conducting classroom lessons	12	20	20	6	2	2.43	0.62	0.38
5. Technical skills can be increased by attending online classes	8	22	10	14	6	2.80	0.51	0.49
6. It is important for instructors to be more effective in online teaching compared with classroom teaching	10	14	20	14	2	2.73	0.59	0.41
7. Students' attention is more important for successful online teaching than classroom teaching	4	22	14	16	4	2.90	0.59	0.41
8. Online mathematics classes are more convenient compared with other subjects	10	24	12	10	4	2.56	0.56	0.44
9. Teaching through local television broadcast is better than teaching online	10	22	18	4	6	2.56	0.57	0.43
10. In spite of costly materials, online classes are helpful for poor students	16	18	16	10	0	2.33	0.60	0.40

The analysis is based on a scale where 1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree.

The results of this study indicate that flexibility and convenience are the major benefits of online education. Online education suits the teaching and learning convenience of the students and the teachers. Bad internet connectivity is a major problem in online education, especially for those who live in rural areas. The data limit and data speed are also limitations of internet infrastructure. These findings reveal that if the state wants to move on with online education it should first focus on its internet facilities.

From Table 8, we see that there is no agreement between student respondents, but in Table 9, the consensus values of statements 6, 8 and 10 of teachers are quite high. This may indicate that network connectivity and data speed are problems faced in online classes in the state of Mizoram; requirement of self-discipline also seems to be high when compared with classroom teaching.

Table 8. Students' responses on advantages and disadvantages of online classes.

Statements/Attributes (students)	1	2	3	4	5	Mean	Cns	Dnt
1. Online classes are convenient and easy to schedule	54	89	125	68	20	2.75	0.59	0.41
2. Online classes provide more comfortable environments	57	94	99	80	26	2.78	0.55	0.45
3. Online classes help improve technical skills	30	46	78	167	35	3.36	0.59	0.41
4. Online classes enable more interaction and greater ability to concentrate	68	124	86	57	21	2.54	0.56	0.44
5. Online classes promote self-discipline and responsibility	64	92	67	86	47	2.88	0.47	0.53
6. Network connectivity hampers online classes	20	35	46	113	142	3.90	0.56	0.44
7. Data limit creates problems for online classes	30	33	57	97	139	3.79	0.50	0.50
8. Data speed creates problems for online classes	30	40	46	106	134	3.76	0.49	0.51
9. Lack of face to face interaction creates problems	38	56	83	112	67	3.32	0.51	0.49
10. Requirement of self-discipline is very high for online classes	17	39	87	118	98	3.70	0.57	0.43
11. I have no suitable devices to participate in online classes	35	81	107	72	61	3.12	0.54	0.46
12. I have no good learning environment	38	89	119	73	37	2.94	0.59	0.41
13. I have technophobia	151	104	67	23	11	1.98	0.61	0.39
14. Cost of software is a problem for me	43	80	121	78	34	2.94	0.59	0.41
15. Cost of mobile phones, laptops, etc. are problems for me	42	90	88	92	44	3.01	0.54	0.46
16. Not having a separate room makes learning difficult for me	46	100	85	71	54	2.96	0.51	0.49

Table 9. Teachers' responses on advantages and disadvantages of online classes.

Statements/Attributes (teachers)	1	2	3	4	5	Mean	Cns	Dnt
1. Online classes have flexible schedules and are convenient	8	12	14	22	4	3.03	0.56	0.44
2. Online classes have more comfortable environments	16	14	12	14	4	2.60	0.48	0.52
3. Online classes improve technical skills	8	6	12	30	4	3.26	0.56	0.44
4. Online classes enable more interaction and greater ability to concentrate	10	16	12	10	12	2.96	0.45	0.55
5. Online classes promote self-discipline and responsibility	14	12	10	20	4	2.80	0.47	0.53
6. My network connectivity hampers my online classes	2	0	2	30	26	4.30	0.72	0.28
7. Data limit causes problems for my online classes	2	2	2	28	26	4.23	0.69	0.31
8. Data speed causes problems for my online classes	0	2	6	28	24	4.23	0.74	0.26
9. Lack of face to face interaction causes problems	2	6	2	34	16	3.93	0.69	0.31
10. Requirement for self discipline is very high for online classes	2	0	6	34	18	4.10	0.75	0.25
11. I have no satisfactory tools or devices to participate in online classes	8	4	8	26	14	3.56	0.50	0.50
12. I have no good learning environment	2	12	22	16	8	3.26	0.62	0.38
13. I have technophobia	16	14	14	6	10	2.66	0.43	0.57
14. Cost of software makes online learning difficult	6	10	12	22	10	3.33	0.52	0.48
15. Cost of mobile phones, laptops, etc. cause difficulties	4	16	10	16	14	3.33	0.48	0.52
16. Not having a separate room makes online learning difficult for me	10	16	8	20	6	2.93	0.48	0.52

5. Discussions

The aim of this research was to examine the preferences and perceptions of students and teachers in Mizoram state about the online classes they attended during the 2020 pandemic lockdown. The degree of consensus was determined by the different statements, on the advantages, disadvantages and factors that affect online classes, through the use of the likert scale.

Most of the teacher respondents preferred online classes during the Covid 19 pandemic lockdown while most of the students preferred suspension of the curriculum scheduled. Most of the students and teachers agreed that Mathematics was the most difficult subject to teach or study through online classes. Most of the students received no benefits while most of the teachers agreed with the television broadcast of lectures through the local channel. Most of the teachers chose laptops for teaching online while most of the students preferred learning using smart phones. Whatsapp was the most preferred communication tool for class updates among students and teachers. Most of the respondents preferred to have technical training before engaging in online classes. Most of the respondents also liked to have privacy to attend online classes. More than half of the students and most of the

teachers preferred questions to be answered by the instructors within a short period of time. Most of the teachers and students believed that online exams were not fair.

From the likert scale, no perfect conclusion can be drawn as the consensus does not vary much from the central value. It is seen that online classes are not much better than teaching broadcast through local television channels, while most of the respondents felt that they did not get much benefit from the local TV broadcasts. This implies that the effectiveness of online classes in the state is not much when compared with classroom teaching. The reasons for ineffectiveness of online teaching and learning are network connectivity, data limit and data speed. These three problems may also be the reasons why many of the respondents preferred the duration of online class to be only 30 minutes. In fact, in order to enhance the productivity of learners', long class hours should be avoided and sufficient break time should be given between two consecutive online classes (Thompson, 2014). The technical proficiency of teachers and students is also a major factor determining the effectiveness of online classes; see Tsai and Lin (2004) and Peng, Tsai and Wu (2006). It is evident that the lack of immediacy in getting answers to queries is one of the challenges in online learning. This problem is reported by Petrides (2002) and Vonderwell (2003).

Due to the different constraints, the present study was restricted to the teachers and students of high schools and higher secondary schools in the state of Mizoram in India. This research study can be extended to north-east Indian states with more inclusions from elementary schools to universities. It is also possible to extend this study in future by dealing with the impact of online classes on society, from the perceptions of students, teachers and parents.

6. Conclusions

During the Covid 19 pandemic lockdown, online education was the only suitable method after learning institutions were closed. Universities and learning institutions shifted to online platforms to complete their syllabi. Online education was found to be advantageous as it provided flexibility and convenience for learners and instructors. Most of the students and teachers reported that due to technological constraints, delayed feedback and ICT- related problems, many challenges were faced in online classes compared with traditional classroom teaching. Thus, all these factors should be considered in designing online courses and effective online classes. The following conclusions can be made regarding the perceptions of teachers and students:

1. Smart phone is the students' preferred choice of device for attending online classes while the Laptop is preferred by teachers for delivering online lessons.
2. The preferred means of communication for both teachers and students is Whatsapp and the main source of internet connection is the Mobile data pack.
3. The preferred software for attending and delivering online lessons are Google meet and Zoom.
4. Most of the students do not benefit from lectures broadcast on television while most of the teachers think it is acceptable.
5. More than half of the students and teachers prefer video contents with reading materials for their online course materials.
6. Privacy is required for most of the students and teachers for online classes.
7. More than half of the students and teachers prefer quizzes and assignments at the end of online classes.
8. Almost all the teachers and most of the students believe that online exams are not fair. In the nature of online exams, most of the students prefer objective questions while teachers prefer both objective and subjective questions.
9. Most of the students and teachers feel that Mathematics is the most difficult subject to study or teach through online classes.
10. It was observed that the network connectivity, data speed, data limit and bad learning environments always create problems for online classes.

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