

# Challenges, Prospects, and Strategies of Emergency Online Education at Secondary Level in the Assam State of India during COVID-19 Pandemic

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## Abstract

The COVID-19 pandemic has forced educational institutions globally to resort to the online mode of teaching and learning. In this paper, we examined how the emergency online education was carried out in the Assam state of India. An explanatory mixed methods study methodology was adopted. Perspectives of 92 students and 30 teachers from 30 secondary level institutions of Assam were examined. Students' acceptability of the emergency online education as well as the effects on the mental and physical health of the students were studied. Moreover, the teachers' perspectives on the emerging online threats were also examined. Data were collected using two separate questionnaires administered to the students and the teachers. It was followed with telephonic interviews with the teachers to gain in-depth knowledge on the studied issues. This study examines both the positive and negative effects of the adoption of online education. The results indicated that all the students could not avail the benefits of this mode. Social messaging apps and online tools like WhatsApp, schools' own mobile apps, Google Classroom LMS and Google Meet, ZOOM, recorded videos and audio tutorials were used to provide online support to the students. Impact on the physical and mental health of the students was observed. The online teaching process led to the generation of a large repository of e-resources. The results also indicated the ignorance of teachers regarding the online threats which could severely affect their students. The study recommended awareness programmes and training sessions for teachers and students on educational technology tools, technologies and approaches for the post-COVID-19 period.

**Keywords:** online education, emergency online education (EOE), secondary education, Covid-19, pandemic, online tools and platforms, online threats.

## Проблемы, перспективы и стратегии экстренного онлайн-образования в штате Ассам (Индия) во время пандемии COVID-19

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### Аннотация

Пандемия COVID-19 вынудила большинство учебных заведений по всему миру перейти на режим онлайн обучения. В этой статье мы рассмотрели, как экстренное онлайн-образование проводилось в штате Ассам в Индии. Авторами проведено сравнительно-пояснительное исследование с использованием смешанных методов. В ходе исследования были изучены мнения 92 учеников и 30 учителей из 30 средних школ Ассама. Были проанализированы доступность и приемлемость экстренного онлайн-образования, а также его влияние на психическое и физическое здоровье учеников. Также была изучена точка зрения учителей о возникающих онлайн-угрозах. Сбор данных осуществлялся с помощью двух анкет, разработанных для учащихся и педагогов. После этапа анкетирования были проведены телефонные интервью с учителями. Результаты исследования показали как положительные, так и отрицательные эффекты внедрения онлайн-образования. Не все учащиеся могли воспользоваться преимуществами нового режима обучения. Было установлено, что онлайн-обучение влияет на физическое и психическое здоровье учеников. Однако текущая ситуация привела к созданию обширного хранилища электронных ресурсов. Результаты также показали, что учителя не осведомлены об онлайн-угрозах, которые могут серьезно влиять на учеников.

**Ключевые слова:** онлайн-образование, экстренное онлайн-образование (ЭОО), среднее образование, онлайн-инструменты и платформы, онлайн-угрозы.

### Introduction

The sudden outbreak of the COVID-19 pandemic forced almost all the countries of the world to impose lockdown. It has brought unprecedented educational disruption for about 1,5 billion students and youths across the globe due to the shutting down of educational institutions (UNESCO, 2021; Zhao et al., 2020a). Like any other country in the world, India was also forced to a nationwide closure of educational institutions which has affected 320 million students (Zhao et al., 2020a) and compelled to arrange for emergency online education for a huge number of students.

Online education is a learning experience in synchronous or/and asynchronous environments with the Internet access (Singh & Thurman, 2019; Sharma & Mishra, 2007). In this mode, anyone can learn anytime from anywhere with the use of digital devices and the Internet access. This mode of learning is more learner-centric, more flexible, and more experimental compared to traditional classroom learning (Paul & Jefferson, 2019). The online support provided by educational institutions during the pandemic are the

response to the global education crisis. However, they lack the characteristics of online education, that is why we term it as Emergency Online Education (EOE).

India has the world's second-largest school system after China with more than 1,5 million schools and about 260 million students (Trines, 2018). Secondary education (SE) in India ranges from class 9 to class 12. It bridges primary education and higher education and hence, occupies a very strategic position in the educational system of the country. Primary education is intended to provide minimum requirements for survival whereas secondary education empowers an individual to become a full member of the complicated society. In this sector, the numbers of schools and students are 271,949 and 631,620,571 respectively (U-DISE, 2021). On the national level, in the higher education sector, India has a total of 1043 universities, more than 42,000 colleges, and more than 11,000 stand-alone institutions (AISHE, 2020), and the number is growing every year. In India, the gross enrolment ratio is 27,1 in the higher education sector, with around 11,1 percent constituting distance education enrolment.

Assam, part of the popular seven sister states, is one of the biggest states in the North-Eastern part of India, covering an area of 78,438 km. As of the 2011 census, the total population of Assam is 31,205,576 of which 15,939 mln are male and 15,266 mln are female; 86 percent of the population lives in rural areas and 14 percent of the population lives in urban areas of the State. Assamese (Axomiya), Bodo, and Bengali are the official languages of Assam (Government of Assam: The State Portal, 2021). There are nearly 53,000 (48,000 government and 5,000 private) lower and upper primary schools and 4,050 higher secondary schools in Assam. There are 308 (301 provincialized and 7 government) colleges giving the degree of Bachelor of Arts, Bachelor of Science, Bachelor of Commerce; 15 engineering colleges (5 government, 1 Public-Private-Partnership, 9 private); 11 government medical colleges; 24 law colleges; 74 teacher training colleges offering the Bachelor of Education degree; 7 Institutes of National Importance; 27 universities (2 central universities, 2 deemed universities, 1 state open university, 1 Women's university and, 6 private universities) in Assam (Govt. of Assam, Department of Education, 2022).

The purpose of this study was to investigate the challenges and prospects faced by the secondary level students of Assam adopting EOE. This study also aimed to identify the various technologies that are adopted by the educational institutions to provide EOE, the issues of access and acceptability of EOE on the part of the students, and also the effects of EOE on the student's physical and mental health. In addition, teachers' perspectives on emerging online threats were studied. Finally, this study tried to find out strategies to overcome the challenges and explore the prospects.

## Literature Review

Due to the global lockdown of schools, the mode of teaching-learning has seen a drastic transformation from face-to-face to emergency online mode to maintain the strict government norms of social distancing. The whole education system be it primary, secondary, or higher education, witnessed a paradigm shift to online education from conventional face-to-face education. Everyone, be them the teachers, the learners, administrators or the parents had to accept and adjust to this new mode of learning, with the restricted facilities and preparedness (Mahanta, 2020).

### *Online education and Emergency online education*

Online educational transaction is completely dependent on Information and Communication Technology (ICT) (Sharma, 2018). In ICT-based learning, technology, digital content, and instructional pedagogy are the key components (Hrastinski, 2008;

Mahanta & Borkotokey, 2018; Schindler et al., 2017). Technology refers to the devices or tools of providing content to the learners such as computers, smartphones, tablets, educational websites (Akyol et al., 2021). The government policies abide teachers to master the competences in e-learning technologies and the use of social media (Salehudin et al., 2021). Academic materials provided to students with the use of electronic devices are called digital content. These are not restricted to only PDF files or presentation slides or simply word files. The interactive, activity-based, and adaptive software like audio or/and video lectures, virtual classrooms, educational games are also called digital content (Short, 2018). A systematic and rational combination of all these components is key to an effective online teaching-learning process. Thus, online education is something more than simply preparing and uploading educational e-content (Aisami, 2020). A proper online course must include a four-quadrant approach, namely, e-Tutorials, e-Contents, Web Resources, and Self-assessment (Mahanta & Borkotokey, 2018). However, online support provided by the educational institutions in the COVID-19 period lack most of the aspects along with the four-quadrant approach of online education. They are closer to remote teaching as they rarely use any instructional design and lack proper student support facilities (Hodges et al., 2020). They are just the response to the crisis that arised due to the pandemic and they mostly try to replace the regular face-to-face classes. Bozkurt and Sharma (2020) refer to this newly evolved educational transaction, that appeared due to the global education crisis, as online emergency remote education (ERE). However, the term “online” is accepted as the buzzword to represent all ICT-based activities in recent years. Therefore, we propose to use the term Emergency Online Education (EOE) instead of ERE. A challenge of emergency remote education is the lack of adequate time to students to become accustomed to “the absence of immediate teacher and peer feedback and support” which is normally available to them in regular face-to-face classes (García-Pastor, 2021, p. 127).

EOE requires suitable digital devices and strong Internet connection along with stable power supply. In the study of 71 countries worldwide, less than half of the population has access to the Internet (UNICEF, 2020a). The situation in India is also not encouraging. A very few (24% to 25%) Indian households have Internet facilities (Pitroda, 2020; Sudevan, 2020; UNICEF, 2020b). Therefore, EOE is beneficial for the privileged group which represents a very small percentage of the total global population. In the regions where there is no access barrier to the Internet, the benefit of online education is apparent (Zhao et al., 2020). Schools can deliver courses online, teachers can provide instructions, share educational resources, and organize assessments. In reality, however, an access to digital devices, technologies, and materials needed to continue online learning is desperately unequal (Jenkins, 2020). Most of the students (89%) in India do not have computers or any other devices such as palm-tops and tablets (Jha, 2020; UNICEF, 2020a). Providing a range of learning tools and an access to the Internet for every school and every child is not possible in a vastly populated country like India. A learning crisis was already evolving in the Indian society before the COVID-19 pandemic, and now due to the school closures, the situation is even more disruptive and expanding (UNICEF, 2020b).

#### *Issues in online education*

Online education has some negative effects on student’s physical and mental health. It also affects student’s health and social life (Chakraborty et al., 2021). The lack of teacher-student and peer groups interactions increases boredom, anxiety, hyperactivity among students (Gopal et al., 2021). Increasing online activities also result in health problems like eye strain, headaches, and fatigue (Nandy, 2020). COVID-19 is still highly affecting people, and to slow down and avoid the spreading of this virus, protocols for complete

or semi-lockdowns and social distancing rules are imposed by the Government of India (MoHFW, 2020) from time to time. Therefore, regarding the complete reopening of the educational institutions is still undecided. In this situation, shifting to an online mode of teaching and learning is the only way to provide education.

Moreover, online threats or web-based threats are the type of cyber safety risks which occur via the Internet. Cyberbullying, viruses, spyware threats, phishing, hackers, and predators are some common examples of online threats. All types of information from educational to recreational, technical to skilled, are available on the Internet in various forms such as written documents, images, audio, and video clippings; it has become an invaluable source of information for all. For the children, searching for a piece of information in the Internet is easier and less time-consuming than accessing it through books. Thus, there is the need to consider the safety of young children with the increasing online education drive. Computers, mobiles, and other Internet-connected devices have become more accessible to children as they need them for school assignments, games, or any type of recreation. Young children may come into contact with undesirable people, inappropriate or harmful content, and malicious software or attacks. It is necessary to teach children about online safety techniques (UNICEF, 2020c). Research studies have revealed that more than 50% of children never discussed their online issues with their parents (Auxier et al., 2020; Shipton, 2011). Moreover, parents and guardians are not conscious of online threat issues. Some parents (34%) ignore this issue, while some others (51%) are generally preoccupied with livelihood issues in the pandemic situation (Mahanta, 2020). Teachers have to play a very important role in inculcating effective use of online resources as well as online threat issues while teaching online (Govender & Skea, 2015).

Shifting to an online mode is not an easy task for traditional educational institutions. All stakeholders, parents, students, teachers, and schools need willpower, investment, and infrastructure (Dhankar, 2021). Services provided to disabled students are a crucial issue (Ozberk et al., 2019). This transition needs proper planning, appropriate infrastructure, skilled and adequate human resources to ensure the three main elements of this system, namely access, quality, and acceptability. It is a multifaceted process that involves careful planning, designing, and determination of aims to create an effective learning ecology (Bozkurt & Sharma, 2020). The common belief about the alternatives to face-to-face education is not encouraging (Al Lily et al., 2020; Mahanta, 2020; Paul, & Jefferson, 2019). The forced shift to online education by educational institutions without proper digital knowledge and skills strengthens this belief (Hodges et al., 2020). So, proper planning and research are necessary for implementing emergency online learning in this time of crisis. Providing online supports to the students of secondary schools is very difficult as not a single secondary level government school has all online infrastructure (Lynch, 2020).

The issues of equity and access are prevalent at every level of education from primary to secondary, and to higher education (UNICEF, 2020a). In India, the number of educational institutions at the secondary level is 271,949; whereas the number of higher education institutions (including universities, colleges, and stand-alone institutions) is 55,165 (AISHE, 2020). Therefore, these issues are found to be more prominent at the secondary level.

In terms of ICT usage, Assam has 10,250,000 Internet users (Kalita, 2018). The irony, however, is that those students who get 4G network, do not possess digital devices to access the Internet (Choudhury, 2021). During the pandemic, most of the institutions bearing some primary and secondary schools switched to an online mode of teaching. While many of the institutions used standard LMS platforms like Google Classroom

and Muddles, some of them worked with their own state-of-the-art LMS platforms (Mahanta, 2021).

This way, it is necessary to conduct research on different aspects of emergency online pedagogies in secondary education in the time of crisis. The field of study deserves proper operational strategies which is why a critical and exploratory study is required.

### **Objectives**

Thus, we framed the purposes of the study as hereunder:

1) To identify various technologies adopted by the educational institutions to provide EOE.

2) To examine issues related to access and acceptability of EOE on the part of the students and to study the effects of EOE on students.

3) To assess teacher's awareness and preparedness to emerging online threats.

In the following sections, we describe the research methods used in this study. Then, we present the results and discussion, and finally, the conclusion of the study. At the end, we suggest further research directions in this particular field of study.

### **Research Methodology**

#### **Research Design**

The purpose of this study was to investigate various issues and challenges of EOE. To reach this goal, this explanatory mixed methods study used both quantitative and qualitative data analysis strategies. The systematic integration or mixing of both the qualitative and quantitative methods within a particular study is an emergent methodology of research (Berman, 2017; Creswell, 2003). It provides a broader and more comprehensive vision of a particular research problem (Almeida, 2018), and hence, facilitates a full understanding of the phenomenon under study (Techo, 2016). In the present study, surveys were conducted to gather both quantitative (closed-ended) and qualitative (open-ended) data. Considering the issues like lockdown and social distancing during COVID-19, data were gathered with the use of online surveys and telephonic conversations. The data were collected from 10th May to 20th May, 2021.

#### **Sample**

The convenience sampling method was used to select 30 secondary schools in the districts of Assam, India. The three factors – type of the school, educational boards, locality of the school – were considered when selecting the schools. Students (N = 100) and teachers (N = 30, one from each school) were selected randomly from the schools. The convenience sampling technique is a non-probability sampling as the sample is taken from an easily reachable group (Elfil & Negida, 2017; Jager et al., 2017). Although it has some disadvantages over probability sampling, convenience sampling is widely used because of its user-friendly nature (Lavrakas, 2008; Koul, 2009). It is cost-effective, data can be collected quickly, and most importantly, available probability samples are ill-suited to examine questions related to behavioural and psychological aspects of human development (Jager et al., 2017). The selected sampling technique is suitable when habits, opinions, and viewpoints are observed in the easiest possible manner (Edgar & Manz, 2017). Probability sampling covers a large unit of the population that represents the group, while non-probability sampling provides in-depth information with careful selection of cases from a small number of units (Etikan & Bala, 2017).

Government and private schools are the two common types of schools in the Assam state of India. The government schools are funded by the State Government and private

schools are managed by individuals, societies, or trusts. Although presently in Assam, there are three education boards, namely, State Board (SEBA for class 9 and 10 and Council for class 11 and 12), Central Board (CBSE), and Indian Certificate of Secondary Education (ICSE), in this study, we considered only two boards – State Board and Central Board – the most common and popular boards in this region.

### **Ethical Approval**

As the data were to be collected from teachers and students, the necessary ethical approval certificate from the “Ethical Committee for Biomedical and Health Research (ECBHR)” of Dibrugarh University, Assam was obtained.

### **Data Collection Tools**

The following tools were constructed and used in the present study:

- a structured questionnaire containing 22 items was prepared using Google Forms to elicit information from the students regarding the issues and challenges of online education.
- a semi-structured questionnaire followed by an interview was constructed to learn about teachers’ awareness and preparedness on emerging online threats.

The questionnaire for the students had four sections. In the first section, general guidelines were provided to the respondents for filling up the questionnaire along with the demographic details of the respondents. The other three sections of the questionnaire comprised the three aspects of this study, namely, issues related to access, willingness and acceptability, mental and physical health. Most of the items were multiple-choice questions ranging from binary (yes/no) options to 5-point Likert-type items. We did not set all the items on the Likert scale as sometimes Likert items are less stable than binary answer formats (Dolnicar et al., 2011). Only one item related to willingness and acceptability was set in the check box form. The Likert items had five levels of agreements ranging from strongly agree (5) to strongly disagree (1). Written instructions given by the concerned authorities and websites of the different boards were also reviewed to collect information.

The questionnaire for teachers also contained four sections. However, for our study, we considered only the section that covered the issues related to the students’ online threats. Both binary (yes/no) options and 5-point Likert-type items were incorporated in this section. All the Likert items had five levels of agreements ranging from strongly disagree (1) to strongly agree (5).

The reliability and validity were established to standardize the questionnaires. The validity of the questionnaires was tested by sending them to three experts looking for an opinion regarding the coverage of all the aspects, language used in the questionnaires. The suggestions given by the experts were incorporated accordingly. The test-retest method of testing reliability was adopted. The final form of the questionnaire for the students was administered to a sample of 15 students and the questionnaire for the teachers was administered to a sample of 10 teachers. After 15 to 20 days, the same questionnaire was administered to the same sample. In this way, the investigators got two independent sets of responses. The two sets of responses were compared and found to be similar in most of the cases. Otherwise, the items were either removed or modified to improve clarity. This process confirmed the high reliability of the questionnaires.

## Data Collection

Although most of the data were based on primary sources, few data were collected based on secondary sources to meet the first research objective. There were three stages of data collection: 1) Google Forms were administered to the students; 2) Google Forms followed by telephonic interviews were employed with the teachers; 3) the institutional documents and websites of the different boards were examined. After gathering all the responses, descriptive statistics like charts, tables, percentages, mean scores and other were used to describe the nature of the data. This type of statistics is very important in research as it presents the data in a more meaningful way (Kohl, 2009). Moreover, there is no uncertainty in descriptive statistics as it describes the people or items that are actually measured by the researcher (Frost et al., 2021). Both qualitative and quantitative analyses were done according to the nature of the information.

## Results and Analysis

The institutional documents and websites of the different boards were reviewed to collect institutional information. Although the Google Form was sent to 100 students, 92 students filled up the form. Data collected through the semi-structured questionnaire and interviews with the teachers provided teachers' views on the emerging online threats. The results were arranged according to the formulated objectives and discussed in the following headings:

### Demographic Information of the Students

Table 1. Demographic Information of the students under study

<i>Aspects related to demography of the students</i>	<i>Details of the aspects</i>	<i>Number of the respondents</i>	<i>Respondent percentage</i>
School Type	Govt. (15)	48	52.2 %
	Private (15)	44	47.8 %
Gender	Male	43	46.7 %
	Female	49	53.3%
Age	14 years	10	11 %
	15 years	24	26.1%
	16 years	29	31.5%
	17 years	17	18.5%
	18 years	12	13 %
Grade	9	23	25%
	10	25	27.2%
	11	21	22.8%
	12	23	25%
Locality	Urban	47	51 %
	Semi-urban	10	11%
	Rural	35	38%

The data indicate that more respondents were studying in government schools (52%). Number of female students (53%) was higher than the male students (47%). Majority of the students were of 15 and 16 years of age. Urban representation is higher than the rural area.



### **Technologies adopted by the educational institutions**

In this study, we found that WhatsApp groups, School-owned apps, Google Classroom and Conference classes (Zoom/Google Meet) were the common online learning tools and platforms. The use of video classes, recorded video and audio tutorials, Power-Point presentations (PPTs), Text (Handwritten notes/ Word/Pdf files) messages, the links of already available OERs (e-contents, YouTube videos) are common online tools adopted by the educational institutions to provide online support to their students.

### **Various issues related to EOE on the part of the students**

To study the issues and challenges faced by the students during their online classes, the participants were asked to rank a few statements (items) (Table 2, Table 3). All statements were ranked according to a 5-point Likert scale, where 5 represents “Strongly agree” and 1 represents “Strongly disagree”. The means of these items were then calculated to determine the overall level of agreement or non-agreement. Some statements were not in the Likert scale format and those were analyzed by calculating the percentage. The detailed discussion is presented below as per the following sub-headings:

#### **Access to Online Education**

Inequality in access due to electricity-related problems or poor Internet connection, the lack of such devices as personal computers, tablets, or smartphones are the main challenges of online teaching and learning (Kundu, 2020). In this study, access to digital devices, personal study space at home, Internet connectivity, and study congenial home environment were studied under the heading “Access”. The following results were revealed:

1. 83.7% of the students had access to digital devices necessary for online education; the other 16.3 % of the students did not have this access. Such students were not able to attend online classes and suffered academic loss which is not easy to overcome in this new normal situation. Moreover, 33.7 % of the students depended on their parents’ mobile phones to engage in online learning. Thus, they could not attend the classes during day time through online mode as the devices were not accessible for them during the day.

2. About 18 % of the students had computers or other digital devices to attend online classes. The numbers coincide with the results reported by UNESCO (Zhao et al., 2020a; Zhao et al., 2020b).

3. A significant number (56.6%) of the respondents who could access digital devices, were not able to attend online classes smoothly at their homes. Poor Internet connectivity (46.7%), environmental disturbances (28.2%), engagement in household activities (23.9%), and the lack of a proper study space (17.4%) were the key reasons identified during the study.

#### **Acceptability of online education**

Other objective of this study was to find out students’ willingness to accept EOE as well as their awareness and ability to gather the appropriate study-related information from the huge web of knowledge. The data on this factor is presented in Table 2.

From the Table 2, it can be inferred that students found online classes less interesting ( $M=3.2$ ), they were aware of the availability of the e-resources ( $M= 3.0$ ), and also knew that searching relevant e-resources from the huge web-hub is not an easy task ( $M=2.7$ ). Further, the students found online learning not convenient ( $M= 2.1$ ).

Table 2. Mean scores and SD of the statements related to willingness and acceptability of online education

Total number of respondents (N=77)	Mean	SD
The online classes are less interesting compared to face-to-face classes	3.2	1.4
The study materials or information related to the study are available on the web	3.0	1.4
Searching for relevant information from the web is not an easy process	2.7	1.3
Online learning is more convenient as I can learn at my own pace of learning	2.1	1.2

Moreover, students were also asked to rank their preferences for online teaching tools (Figure 1). A significant number (53.2%) of the students gave the highest preference to the live classes, and very few students (26%) preferred recorded video classes. However, research studies showed that live video lectures were equally effective as recorded video lectures (Bahnsen & Olejnikova, 2017; Brockfeld et al., 2018). This is in contradiction to our findings. The reason behind this may be both the pandemic situation, as the learners were missing school, and the maturity level of the students. In this study, the students were adolescents whereas in the above-mentioned studies they were adult learners.

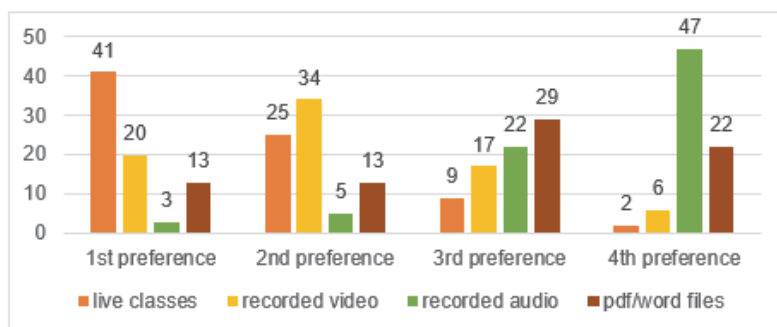


Figure 1. Preferences for the various modes of EOE

### Effects of EOE on the students

Another objective of this study was to examine the effects of online education on the mental and physical health of the students (Table 3).

Table 3. Mean scores and SD of issues related to mental and physical health

Number of respondents (N=77)	Mean	SD
I feel fatigued after attending 2/3 hours of online classes	3.2	1.4
I've been suffering from headaches, eye problems, or insomnia (sleeplessness) since last year	2.6	1.3
Due to the absence of face-to-face interactions with teachers and peers, I feel isolated	3.1	1.4
I am not able to study the materials provided by the teachers in time, which creates anxiety	3.0	1.4
It is difficult for me to resist the various pop-outs/ notifications that appear during the online study	3.2	1.4

It is apparent from Table 3 that regarding physical health issues, students felt fatigued after attending 2/3 hours of online classes ( $M=3.2$ ). At the same time, they did not suffer from headaches, eye problems, or insomnia ( $M=2.6$ ). The students reported the feelings of isolation ( $M=3.1$ ) and anxiety ( $M=3.1$ ). The latter occurred when the study materials piled up as students lagged behind. These results are in agreement with the study by Elmer and colleagues (2020) who compared students' mental health before and after the crisis and found that students' levels of stress, anxiety, loneliness, and depressive symptoms increased during online learning.

The various pop-outs/notifications that appear during the online study disturbed the students' concentration ( $M=3.2$ ). Previous research studies revealed that notifications from Facebook, email, WhatsApp and other social media services, including missed calls, significantly interrupted the learning process. Such notifications distracted the students even when they were not directly interacting with a mobile device during a particular task (Meyer, 2015). It is expected that such a distraction would affect young students at the secondary level more.

Some unique opinions from the open-ended questions are listed below:

1. They can watch or listen to the recorded video/audio again and again to understand the content of the study which is not possible in the regular classroom situation and so, online mode is beneficial for them.

2. The study from home is saving their time as there is no school. They are getting more time to study as well as to fulfill their hobbies or to do some creative work.

3. They are becoming more skillful in online activities which is very much important in the present ICT-centric world.

4. Some teachers' classes are very interesting whereas others were very boring. Teachers should be trained properly to handle this online mode of learning by the authority, and teachers themselves should be enthusiastic in this context.

5. Unable to concentrate in the home environment.

6. Regular classes are better, because learning is more congenial in a face-to-face situation.

7. Regular classes are better, because they do not have access to smartphones or TV or radio. They have to go to their neighbors, classmates, or relatives' places.

### Teachers' views on emerging online threats

We also studied the teachers' views on the emerging online threats that arise as a result of the EOE (Table 4).

Table 4. Mean scores and SD of teachers' views on emerging online threats

Total number of teachers (N= 30)	Mean	SD
There are online threats associated with online teaching	3.2	2.8
Studying online materials on online threats and consulting this issue with others are a waste of time, since due to online classes teachers are struggling to adjust to the new situation	2.5	2.3
It is necessary to take some measures to orient students against these threats	2.4	2.0

Regarding teachers' awareness of online threats, it is apparent from Table 4 that although the teachers were aware of the online risks and threats ( $M=3.2$ ), they felt that studying and consulting this issue with others was a waste of time, since due to online classes teachers were already in pressure in adjusting to the new situation ( $M=2.5$ ).

Moreover, they reported that no measures should be taken to orient students on how to handle online threats ( $M=2.4$ ).

The teachers were also requested to provide some examples of online threats. Their responses are listed in Table 5.

Table 5. Types of online threats reported by the teachers

	<i>Types of online threats</i>	<i>Descriptions</i>	<i>% of responses</i>
1	Cyberbullying and cyberstalking	Online or electronic communication to bully a person, sending messages of an unapproachable or threatening manner	76.6
2	Inappropriate materials	Sexually explicit content like pornographic images and video, violent or graphic content, use of obscene words or drugs, tobacco, alcohol	60
3	Downloads of pirated materials	Films, music, games, or video files	66.7
4	Cyber Predators	Mislead children by giving messages in social media or gaming lobby chat rooms or exploit usually younger people for sexual and other purposes through the Internet	53.3
5	Posting private personal information	Sharing of personal information of themselves through social media	63.3
6	Phishing	Cheating children out of sensitive info about themselves or parents, Fake Websites, hijacking e-mail, or credit/ debit card PIN	46.7
7	Malware infections	May take place in peer-to-peer (P2P) file-sharing programs, web links, attachments	43.3
8	Undesirable advertisement, pop-ups, and adware programs	Often automatically flashes with social media sites and also during downloading or watching YouTube videos	73.3
9	Spyware	Malicious software designed to enter digital devices, gather data about the owner, and forward it to a third party without consent	56.7
10	Drive-by downloads	Some malicious programs are automatically downloaded and installed on the computer	40

Table 5 revealed that the teachers were sufficiently aware of various online threats that could directly affect the students. However, they were not enthusiastic to spent time educating their students against such threats. Moreover, it was found that only one school from the sample had adopted some mechanism to monitor students during the online classes.

## Discussion

During the COVID-19 pandemic, all educational institutions had to cope with the changing educational scenario. Mahanta (2020) carried out the study on the online support provided by the schools during COVID-19 in the Dibrugarh District of Assam during April 2020 and found that no schools had used such tools as the school's owned apps, Google Classroom, video-conference classes, and OER during that period. Senior teachers were not able to conduct classes online. However, after one year, 70% of schools

started using video-conference classes, 89% of teachers prepared very efficient video tutorials, and provided their students with content-related e-resources. Therefore, it can be speculated that as the school closedown period got extended, schools were bound to adopt different digital modes of teaching and learning, and teachers had to learn to use different technological tools to provide support to their students. Moreover, interviews with the teachers revealed that not only the students and teachers, but also parents were adopting technological sense.

Regarding the issues related to access and acceptability of EOE, it was found that although the majority of the students (83.7%) had access to digital devices, they were unable to avail the benefits of EOE due to various reasons like dependency on parents' mobile phones, poor network bandwidth, environmental disturbances, engagement in household activities and the lack of proper study space. This resembles with the claims of other researches (Jenkins, 2020; Jha, 2020; UNICEF, 2020a, UNICEF, 2020b).

Previous studies revealed that live video lectures were equally effective as recorded video lectures (Bahnon & Olejnikova, 2017; Brockfeld et al., 2018). Our findings are different as in this present study, the majority of the students (53.2%) preferred live classes, and only a few students (26%) preferred recorded video classes. The reason behind this may be both the pandemic situation (as the learners were missing school) and the maturity levels of the students. In this study, the students were adolescents whereas in the above-mentioned studies they were adult learners.

Regarding the mental and physical health of the students, our results are in line with the study of Elmer and colleagues (2020) who compared the mental health of the students before and after the crisis and found that students' levels of stress, anxiety, loneliness, and depressive symptoms increased during online learning.

Similarly, this study revealed that various pop-outs/notifications that appear during the online study disturbed the students' concentration. Similar results were found by Meyer (2015), according to whom notifications from Facebook, email, WhatsApp including missed phone calls significantly interrupted the learning process. Such notifications distracted the students even when they were not directly interacting with a mobile device during a particular task. It is expected that such a distraction would affect the young students at the secondary level more.

The open-ended statements helped to judge the students' feelings, views, and opinions regarding an online teaching and learning system. Students were found to have positive opinions regarding an online mode of learning. Students' positive attitude towards EOE is crucial for the teaching and learning process across the globe in this new normal situation. It can be seen from their views that they were able to identify the positive aspects of this mode of learning like watching or listening to the classes for several times, using teacher-made notes, learning according to their own pace of learning, saving time, and other aspects. Digital literacy is a life skill in the present era of a growing and global educational society (Singh, 2018); hence, digital literacy is a must for survival in any discipline in this present ICT-enabled world. Thus, developing skills in online activities will help students to a great extent in the near future. As suggested by the students, teacher training is essential, because even in the post-COVID situation online teaching-learning may continue. It may be combined in the school curriculum employing a blended mode of learning considering its benefits.

The lack of concentration in the home environment, involvement in household activities during online classes, the lack of access to digital devices and the Internet and other problems were some significant undesirable aspects that were evident through the open-ended questions. The achievement scores of the students who used computers at home and/or had the Internet access at home were higher than for those who did not

access those facilities at home (Hussar & Bailey, 2017). Therefore, these aspects should be considered before incorporating EOE in the educational institutions of the country.

Regarding the teacher's perception of online threats, it was found that the teachers were not in the favor of guiding students to mitigate such threats arising out of online education. This aggravates UNICEF's concerns about the online risks to young learners as their lives move increasingly online during school closures due to the COVID-19 pandemic (UNICEF, 2020c).

### Limitations

This study was limited within the state of Assam, India. Moreover, the findings of this study can not be generalized as we have adopted convenience sampling method which is a non-probability sampling method of collecting data in research. Furthermore, only partial responses, that is demographic information, could be gathered from a few (17.3%) participants due to the issue of non-availability of digital devices. Another limitation of this study is that most of the participants were from urban areas (51%), whereas most of the population of Assam belong to rural locality (86%).

### Conclusions

In this study, we found that although educational institutions in the Assam State of India were very much enthusiastic about adopting online teaching-learning, its "access" is still a concern. It can be considered as a powerful tool for the teaching and learning process if it is accessible to all. The lack of personal study space at home, low Internet bandwidth, the lack of study congenial home environment are some of the key reasons identified to be responsible for the partial failure of this mode of learning. Some of these issues are not specific to the socio-economic backgrounds of the students, for example, low Internet bandwidth has affected all sections of the society uniformly.

One of the significant positive outcomes of the adoption of EOE during the COVID-19 situation is that a rich repository of e-resources has been created. This will immensely help the students from the vernacular medium as e-resources in the vernacular medium were limited before the pandemic.

Learning resources could be made more interesting to sustain students' attention. Thus, the focus should be given to the development of learning resources as well as innovative presentation methods to make the teaching-learning process a stimulating experience on the part of both teachers and students. Further, the blended mode of learning can be adopted in the post-COVID situation to make the whole educational transaction more interesting and fruitful as students wanted to switch their preferences between online and face-to-face within a course (Kemp & Grieve, 2014).

It was also found that online mode may affect both the physical and mental health of the students. The feeling of isolation on the part of the students can be reduced by encouraging two-way communication either between the teacher and the students or among the students. Usage of online discussions, one-to-one and/or group chatting, quizzes with reinforcement during teaching-learning may be some further examples. Similarly, home assignments and activities may motivate students to study online materials on time which can lower the anxiety level of younger students to a good extent. Moreover, co-curricular and extra-curricular activities, like speech, recitation, story telling, dance, singing, drawing and others can be arranged among students through online platforms for students' mental health improvement. Students should be encouraged to participate based on their own competencies and willingness. To tackle issues related to students' physical health, consecutive online classes, recorded video classes of long durations should

be avoided. Besides teaching and instruction, the guidance provided by the teachers to their students is also very important for the EOE process.

In our study, we found that the teachers ignored the awareness part of the online threats that can affect their students heavily. This may result in further jeopardy of the entire society as such activities affect all its stakeholders. To prevent this from happening, the teachers should be motivated and also need to be properly trained to guide their students from falling prey to online threats.

### Recommendations

The paradigm shift instrumented by the COVID-19 pandemic has affected all aspects of human civilization, whether it is socio-economic, political, scientific, or educational. The rapid change in the education sector forced the stakeholders of this sector to adopt this digital mode of learning with the existing limited facility and preparedness. The changes due to the adoption of the digital mode have also their lows and highs. Those who are not techno-friendly cannot survive in this mode. All the stakeholders, from parents to administrators, from teachers to students must have commendable knowledge of educational technology, both hardware and software. We believe that this study has opened up new avenues for further investigations of the effects of online education during and post-COVID situations, and the research will contribute to the theory and practice of education. Especially, in-depth studies on the issues arising from online threats will help the young generations to overcome mental and physical disorders and to become a productive entity for the nation.

### Statement on conflict of interest

The authors declare that there is no conflict of interest.

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