Education in emergency: Action research on online teaching and learning practice in a Bhutanese school during the COVID-19 pandemic.

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Abstract

Countries around the world were disrupted because of COVID-19 in the year 2020. All sorts of lives were affected and Bhutan too was not spared. Education system in Bhutan had to come-up with different strategies to cater the learning needs of the students. There was no option other than using online teaching and learning mode amid the lock downs and closure of the schools. The mode was a novice concept to most teachers. Thus, we explored strategies a teacher could use to teach online and students' opinion on it using mixed methods approach. We designed a strategy to teach students on online mode. The strategy focused on inclusion of salient features of online teaching and learning. These features aligned to creating constructive and collaborative learning environment, timely support, quality tools, effective assessment strategy, and timely feedbacks. The intervention strategy was implemented for eight months. At the end of the academic year, a survey questionnaire was administered to 56 students of classes six and seven. To further gain insights into the practices, semi-structured interviews were employed with five students and the teacher practitioner maintained a journal for every online lesson. Responses from the survey showed that salient features could be created in an online mode of teaching and learning. However, technological issues, students' inability to manage time, inadequate technical knowledge, and student participation were identified as some of the challenges.

Keywords: Action research, online teaching and learning, COVID-19 pandemic, Bhutanese School,21st century skills

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Introduction

COVID-19 has created a pandemic across the globe. Bhutan witnessed its first case on 5th March, 2020. Since then, as a precautionary and preventive measure, all the educational institutions in the nation remained closed starting 19th March, 2020 with the directives from the Prime Minister's Office although schools in three dzongkhags (Paro, Punakha and Thimphu) remained closed since 6th March, 2020. This disruption showed that Bhutan's education system was in emergency. COOPI (2018) defines Education in Emergency (EiE) as "set of project activities that allow structured learning to continue in situations of emergency, crisis or long-term instability" (p. 6).

According to Royal Education Council (REC), Ministry of Education (MoE), and Bhutan Council for School Examination and Assessment (BCSEA), (2020), during the emergency period, schools were expected to educate students using adapted curriculum and assessment with the support from various stakeholders. Amid the COVID-19 outbreak, adapted curriculum recommended by REC was used since regular teaching was not feasible.

The guidelines developed by REC, MoE, and BCSEA (2020) were provided based on key stages, which included areas to teach and recommended teaching tools that teacher could use to teach different topics and subjects. Classes PP-XII were divided into five key stages: Key stage I: PP-III; Key stage II: IV-VI; Key stage III: VII-VIII; Key stage IV: IX-X; and Key stage V: XI-XII.

This study specifically focused on classes VI and VII. These classes were categorized under key stages II and III respectively. The guideline did not include what aspects to teach for social studies in key stage II. It seemed like the schools did not have to teach and learn the subject. However, the Principal Researcher taught social studies to class VI students to see the feasibility of technology tools and online teaching and learning during the pandemic.

The guide clearly showed that the students had to be engaged meaningfully through various online tools such as social media, Google Classroom, Bhutan Broadcasting Service (BBS), and YouTube. Furthermore, the MoE had specifically recommended teachers to use online platforms such as social media for classes PP to III and Google Classroom for students of classes IV to XII. Teachers of all levels were expected to provide activities using lessons delivered on the national television (BBS) too.

Amidst the pandemic, online teaching and learning was necessary to have continued teaching and learning for all the students. In such situation, teachers were left with no option

but to embrace online mode of teaching and learning despite their limited or no information and communication technology (ICT) knowledge and skills. Teachers had to teach students online using available ICT resources and this action research is mindfully selected and carried out to investigate and implement strategies feasible for teachers to use for effective online teaching and learning mode.

Situational Analysis

With an abrupt lock down in the nation, everyone was anxious about the mode of teaching and learning to be adopted by the schools. The MoE expected schools to continue teaching and learning despite the lock down. Hence, all the schools were expected to adopt online teaching and learning method. Online teaching was not an option but a necessity to cater to the needs of progressive education for students. Nevertheless, we observed that there was panic amongst the teachers, since the concept was completely new to them. A survey questionnaire was catered to 32 teachers of the school but only 18 of them responded. The questionnaire intended to explore teacher's prior experiences with and preferences over online teaching. Teachers did not have any prior experiences related to online teaching (83%) although about 67% of them received a professional development program on using Google Classroom from their Information, Communication and Technology (ICT) teacher colleague. All 18 teachers agreed about having challenges while using online teaching for various reasons. They were lacking in terms of ICT knowledge, experiences and resources. In addition, teachers hardly received student's collaboration. These relate to the findings of prior studies carried out in Bhutanese context during the pandemic (Chogyal et al., 2021; Pokhrel & Chhetri, 2021; Wangmo et al., 2020;)

Both teachers and students had no idea about online mode of teaching and learning. Since the online teaching and learning was completely a new concept for most of the teachers and students, there were arguments related to its accessibility, affordability, policy and pedagogy. Thus, this action research intended to explore practical processes of teaching online and provide suggestions and recommendations for effective ways to use it.

In the midst of this pandemic, the education fraternity was reminded that this is 21st century in which online mode of teaching and learning has become a norm. Sun and Chen (2016) state that online teaching and learning caters to the learning needs of the learners of diverse community, background and experiences. They recommended future researchers to explore systematic implementation of effective instructional practices for online teaching and

learning, and whether online lessons improved the academic outcomes of the students.

Literature Review

With the change in education system amid the COVID-19 pandemic, e-learning is the only relevant pedagogy suitable for the paradigm shift. Pokhrel and Chhetri (2021, p. 5) state that e-learning tools significantly facilitated teaching and learning during the pandemic when lock down was a frequent measure to tackle it. Further, existing literature suggest that "e-learning includes all application of technological solutions to the problem of finding the best match between the needs of a given set of learners with their individual learning demands to learn a given content, using a given set of tools" (Nycz & Cohen, 2007, p. 2).

There are different types of e-Learning. One such kind is blended learning. According to Cleveland-Innes and Wilton (2018), blended learning is divided into three models *viz* blended presentation and interaction, blended block model, and fully online. This paper focuses on the third model which incurs learning fully online with synchronous and asynchronous activities.

Synchronous learning happens in real time with students through web conferencing or webinar tools and applications such as Zoom and Google Meet. Conversely, students learn at their own pace and time from anywhere around the world in asynchronous learning. Students are provided with materials online and they follow accordingly. Deadlines are provided for structure or support; however, it could be loose or strict (Cleveland-Innes & Wilton, 2018). Use of online strategies such as blended learning has advantages. They cater to the needs of the students with diverse learning styles and experiences, enhance their information and communication technology knowledge, also promotes multidisciplinary and trans-disciplinary strategies (Capone et al, 2017). In addition, it promotes students to collaborate virtually in pursuit on intellectual endeavor, increases learning flexibility from anywhere and anytime, promotes interaction amongst students and with their teacher, enhances improved learning activities and engagement, and develops digital learning skills to become virtual citizens (Cleveland-Innes & Wilton, 2018)

Nevertheless, there are some challenges in e-Learning. Few studies reported that e-learnings are more expensive than traditional method which would hinder some students to access the internet and own a technology (Chogyal et al., 2021; Connolly & Stansfield, 2007; Pokhrel & Chhetri, 2021; Wangdi et al., 2021).

There are other disadvantages like burdening students to be more self-disciplined and motivated, increased workload for both students and teacher, and higher rate of dropouts and low achievers since students who do not get involved in the virtual community may feel lonely, low self-esteem and isolation (Connolly & Stansfield, 2007; Chogyal et al., 2021; Pokhrel & Chhetri, 2021; and Wangdi et al., 2021). Despite the challenges, avoidance and ignorance of use of technologies is inevitable. For instance, Trilling and Fadel (2009) state three sets of 21st century knowledge and skills needed for the students as shown below:

- Learning and Innovation Skills: Critical thinking and problem solving, Communicating and collaboration, Creativity and innovation
- Information, Media, and Technology Skills
- Life and Career Skills

Due to the dearth of literature in the Bhutanese context, it cannot be ascertained if Bhutanese school students also face similar issues. However, a few researches at the higher education level in the Bhutanese context suggest similar issues such as poor Internet connectivity and limited pedagogical and technological knowledge and skills. More than 80% of the higher education faculty participants showed the need for professional development program on blended learning and ICT skills (Choden & Sherab, 2019). Similar to the teaching faculty at the university level, pre-service teachers were found to have inadequate knowledge on technology despite the information and technology modules they have completed during the four-year course (Sherab, et al., 2022). Some recent researches have shown that (Kado et al., 2020; Wangdi et al., 2021) Google Classroom was useful as virtual learning platform, however, school students preferred social media over it. Their studies also found that Bhutanese students and teachers did not find online learning interesting. Moreover, students were distracted by the online games. Sherab, et al. (2022) recommended the future researchers to examine Bhutanese teacher's online teaching experiences during the pandemic since all the teachers had to undergo online teaching and learning. In accordance to this recommendation, the authors of this study explored a teacher's online experience during the pandemic. Moreover, limited prior studies as presented above have shown that Bhutanese teachers and students are in need of professional development program on educational technologies and ICT. Therefore, this action research was intended to explore the type of online teaching and learning strategies teachers could employ in making the online teaching and learning effective.

Research Questions

This action research intended to answer the following research questions:

1. How could a teacher foster constructive and collaborative online learning environment?

2. What are the strengths and challenges of teaching and learning online?

3. Which online mode of teaching and learning (synchronous or asynchronous) is preferred by the students?

4. How could a teacher teach and assess online effectively?

Methodology

This action research employed a mixed method approach (Cooksey & McDonald, 2019). Survey questionnaire and semi-structured interviews, a were administered to collect data. The teacher researcher also maintained reflective journey during the entire research process. Survey questionnaire was based on principles of using technologies effectively as shown in the book edited by Buzzetto-Hollywood (2007). The book showed significant components of using online mode for teaching and learning. Thus 63-item survey questionnaire was developed to explore whether the teacher had administered all these features in the online teaching through her students' perspective. These items were categorized into seven broad categories as shown in Table 1:

Table 1: *Category of items*

Sl. No.	Category	Number of items
1	Technology for constructive teaching and learning.	13
2	Use of V tools (voice, video and virtual) during online teaching and learning.	7
3	Viable of support for students and collaboration during online teaching and learning.	10
4	Feedback and assessment mechanism for online learning.	15
5	Students' opinion on synchronous and asynchronous lessons.	2
6	Students' preference amongst social media and Google Classroom for online learning.	7
7	Challenges of online teaching and learning.	8

The respondents for survey questionnaire were students (n=56) from classes six (n=24) and seven (n=32). The survey questionnaire was designed to understand whether online teaching and learning could be implemented effectively for the students. Semi-structured interviews with five purposefully selected students (two girls and three boys) were administered to learn about their experience of learning through online. In addition, the teacher researcher maintained a lesson log and a journal reflecting on every online lesson.

Baseline data were collected solely to understand students' background and the kind of device they used for the online teaching and learning during the pandemic. A total of 92 students of classes six and seven responded to the survey. The data showed that most students were of ages 12 years (49%) and 13 years (25%). Almost 50 percent of them came from a family whose parents were civil servants. Students used three forms of devices as shown in Table 2.

Table 2: *Different types of devices used by the students for online learning (n=92)*

Type of devices	Number of students	Percentage
Smart Phone	79	85.87%
Laptop	1	1.09%
Desktop	1	1.09%
Tablet	11	11.96%

This showed that majority (almost 86%) of the students used mobile phones for their online learning. Therefore, we developed strategies that suited the learning through smart phones.

Intervention Phase

We designed approaches to teach online. In doing so, the online lessons featured the concepts of developing constructive learning environment to enhance e-learning (Connolly & Stansfield, 2007), the role of interaction on e-learning (Sweat-Guy, 2007), video, voice, and virtual collaboration: The 3 V's of asynchronous education (Girard, et al., 2007) and supporting students on their e-journey (Goldsmith & Strachan, 2007).

Intervention phase started in March and ended in November. It was carried out for about eight months excluding a month of vacation in August. The teacher researcher had a day each in a week to teach her subject to students of class seven (Tuesdays) and class six (Thursdays). She planned and executed her lessons with her critical friends (co-authors). They are experts in the field of technology and education, thus rendered all the necessary supports and guided the teacher. Moreover, they conducted synchronous online lessons with the students for a few times.

The principal researcher taught all the prescribed topics of English subject for class seven students and all the topics in social studies subject for class six students. In fact, the teacher taught some extra topics like blogging, poetry recitation, and booktalks.

Intervention Strategies

In order to implement online teaching and learning, and investigate its effectiveness and guide this study, we used the features of practices mentioned in the book, "Principles of Effective Online Teaching" by Buzzetto-More (2007). Also, we have mindfully adapted the content of the prescribed syllabus and texts to suit the current study and followed strategies as shown below:

Developed constructive learning environment to enhance e-learning

Students were involved in active learning process in which they constructed new ideas or concepts based on their current or prior knowledge. As advised by Connolly and Stansfield (2007), the teacher:

- provided activities that allowed students to develop their analytical and problem-solving skills. Further, allowed students to relate the learning with the real world outside the learning context.
- motivated students to take accountability for their learning and being mindful about their knowledge construction process.

Developed collaborative online learning community

Challenging though, it was essential to create collaborative online learning community since it enhanced students' learning. It motivates students to complete the course and learn independently (Guy, 2006). Following activities were implemented to enhance collaborative learning community:

- Students posted their introductory message about themselves.

- Introduced a team activity that did not grade or judge them.
- Used ice-breakers. For example, student gave three answers to three interesting questions about themselves and then others had to guess what those questions were and the original author lets them know if they were right or wrong.
- Allowed students to develop collaborative learning and working goals in teams.

Assessment and Feedback:

Connolly and Stansfield (2007) and Girard et al., (2007) recommended immediate and personalized feedback for students after completing their assignments. They suggested voice feedback so that the students would know there was a real person on the end of the Ethernet. In line to this, assessment and feedback mechanism for this study was carried out accordingly as shown below:

- Provided feedback that allowed students to reflect and evaluate their own learning.
- While providing feedback, teacher moved from general to specific by describing strengths and weaknesses.
- Prepared and provided rubrics for most activities to touch on each of the elements expected to achieve and observe.
- Commented on areas that needed future attention.
- Personalized the comments by mentioning students' names.

Tools for online teaching and learning:

Teacher conducted both synchronous and asynchronous online teaching and learning. Both the teacher and students participated in learning activities at the same time in asynchronous online lessons. On the other hand, in asynchronous online teaching and learning, teacher and students participated in learning activities at different schedules. In order to conduct the classes in both cases effectively, Girard, et al. (2007) suggested three Vtools- Video, Voice, and Virtual Team Collaboration.

Following tools were used for this study since they had Vtool features:

- Video
- Camtasia
- Google Classroom
- Google Meet
- Phone calls

- Chats

The lessons imparted through videos considered three key elements- quality, accessibility, and technology. In terms of quality, the video lessons were short (certainly less than 15 minutes) with subject name and title stated clearly. Teacher planned the video and practiced it thoroughly. In regard to accessibility, teacher ensured that the lessons were accessible to students despite the Internet connectivity issue. In some places internet connection was slow, for them the teacher uploaded a file that required low speed. For instance, use of Camtasia with low weighing file.

Support mechanism for students:

Aligning to Goldsmith and Strachan's (2007) advise, students were provided with the following support system at different stages of online learning:

i.   Starting point:
- Helped begin using login IDs and passwords.
- Made students feel welcomed and be part of the learning community by familiarizing with Google Classroom and people whom to contact for support.
- Invited learners to share their expectations.
- Discussed and set time for lessons to be uploaded.
- Started with simple task first by posting simple messages by both teacher and students.

ii.   Along the way:
- Provided both formal and informal checkpoints regularly by sending messages, emails, and phone calls to check and ask how their studies were going.
- Provided clear assessment criteria.
- Catered e-learning according to student's conveniences which was flexible and open.

iii. At the end:
- Kept the online teaching and learning continued with renewed energy and skills by providing support and encouragement.
- Provided regular checkpoints to ensure students were on the right track.
- Completed the academic year positively by meeting virtually at the end in November.

Findings

The participants for this study responded to self-designed survey questionnaire based on a

five-point Likert type scale ranging from 1- strongly disagree, 2- disagree, 3-Neither agree nor disagree, 4- agree and 5- strongly agree. The 63-item survey questionnaire was analyzed using SPSS to generate mean and standard deviation. Interview data and journal entries were later triangulated and merged with survey themes. Pseudonyms S1, S2, S3, S4 and S5 are used to hide student interviewees' identity. The key findings from the data are shown in the following sections.

Technology for constructive teaching and learning

There were 13 items to determine whether online learning enhanced constructive learning environment for the students. To this, students agreed that online teaching and learning enhanced constructive learning experiences (M= 3.61; SD=0.36). To specify on minor characteristics of constructive learning experiences, students agreed that the lessons and assignments given online gave them new ideas (M=4.04; SD=0.58) and the activities were related to real-life situations (M=3.86; S=0.65).

Further, online learning enabled students to think critically (M=4.05; SD= 0.70), to engage meaningfully (M=3.43; SD=0.85) and to reflect and learn in accordance to their learning styles (M=3.89; SD=0.56). Most importantly, students were able to learn the content of the subject (M=4.00; SD=0.51) and explore technologies (M=4.16; SD=0.73) through online learning.

Qualitative data confirmed that students could learn meaningfully from online lessons. For instance, one student (S1) stated:
I found English lessons interesting since I understood them. We did different types of questions and activities. Teacher taught with video lessons, PPTs and presentations. Teacher also taught us many new things like blogging, quizzes, etc.

Teacher's lesson log and journal showed that most topics could be taught online. For instance, before teaching the story, she gave the title on the announcement page of the Google Classroom, and made students provide answers in the comment section. All students were able to see one another's answers. Then, she provided the video lesson using Camtasia. Students watched it and along with that, tasks were given to perform. She also sent separate files in Google Classroom that consisted PPT slides, notes, and assignment questions. Assignments checked all skills: knowledge, comprehension, application, analysis, evaluation, and synthesis.

Use of v tools during online teaching and learning

Seven items investigated use of effective features and use of vtools. Students strongly agreed (M=4.45; SD=0.60) that video lessons were used to teach the concepts and content of the lessons. They also strongly agreed that the video lessons were of less than 20 minutes (M=4.43; SD=0.57). Video lessons given online by the teacher were comprehensible (M=3.80; SD=0.88) and, clear and audible (M=3.96; SD=0.79). Students were able to watch the video lessons given by the teacher online (M=3.33; SD=0.84). A student (S2) said in her interview that she liked when her teacher sent video lessons not just tasks because she was able to understand more from the video lessons.

Further, qualitative data showed that the video lessons were helpful and easy to access. For instance, S4 said, *"I found the video lessons interesting because we haven't come across this in the school."* Another student (S3) said:
I was not able to open attachments for other subjects since they were heavy. But the files given by the English teacher was accessible easily. English lessons were easier to open because it needed less storage and files were smaller. We could see and do our work at minimal cost. The video lesson cost less.

Viability of support for students and collaboration through online learning

Ten items explored student support and collaborations during online learning. Students strongly agreed that they received the support required from their teacher in operating and using the Google Classroom (M=4.27; SD=0.65). Apart from operation of the online system, students knew whom to consult if they encountered any sort of challenges during online learning (M=4.02; SD=0.84). Also, students knew the timing of the subjects (M=4.14; SD=0.70) and due dates of their online assignments (M=4.23; SD=0.66).

Students agreed that online learning gave them opportunities to interact with their friends (M=3.82; SD=0.97) and teachers (M=3.80; SD=0.72). Students did agree that they had to meet with their friends online and do their assignments together though the responses varied amongst the respondents (M=3.73; SD=1.05). However, they neither agreed nor disagreed about having a group amongst themselves to discuss on the assignments (M=3.07; SD=1.36). Qualitative data indicated that students did have interaction with their friends and teacher mostly to clarify their doubts. According to S3, *"I interact with my friends. We ask help from each other when we are struck with our assignments. We clarify our doubts."* Similarly, S2 confirmed, *"If we had doubts, we asked our friends first, then only we ask our teacher."*

Feedback and assessment mechanism for online learning

Fifteen items explored the feasibility of effective feedback and assessment mechanism in online teaching and learning. The findings indicate that students mostly received written feedback not through voice recordings. Students strongly agreed that they received written feedback on their assignment (M=4.27; SD=0.62) but neither agreed nor disagreed upon receiving voice feedback on the assignments. Entries from the teacher's journal showed that the teacher made phone calls only to those students who did not send their assignments. Students agreed that the teacher gave positive feedback (M=3.88; SD=0.76) which encouraged them to work harder and improve their future assignments (M=4.07; SD=0.58). Findings from the qualitative data aligned with the survey finding. According to S1, *"English teacher stated on right and wrong responses and this helped me to improve my works and learnings."* Student preferred to have feedbacks given on all the assignments. S4 stated, *"Teacher give some feedbacks in Google Classroom. Detailed feedback is given to some works but not on all."*

In line to assessment, students knew which assignments were assessed (M=4.05; SD=0.59) and how they were assessed (M=3.77; SD=0.83). They also agreed that the teacher gave comprehensible rubrics (M=4.11; SD= 0.53). Moreover, students were able to evaluate their own works (M=3.75; SD=0.92). The usefulness of the assessment was also captured in the statements of different students as shown below:

"I found the assessment done by the teacher useful. It showed how we were doing. Looking at the marks we could improve." (S4); *"the scores made us work harder and do better in our next assignment."* (S2); and *"It (assessment) encouraged students who do not perform online to do their works."* (S1)

Through teacher's journal, it was evident that quizzes and feedback could be collected conveniently using Google Docs/ Google Sheet to check students' understanding. She used them frequently in her lessons. Also, rubrics could be given with clear descriptions for the assignments which were assessed.

Another journal entry of the teacher showed that students and their parents took into consideration when scores were given and if that determined student's promotion to next class level. *"Most parents and students were seen coming to school and solving issues like clarifying doubts and opening of Google Docs. They were worried about the scores since they were informed that a student will be promoted based on his/her assignments submitted*

online." (Dated September 24, 2020)

Participant's opinion on synchronous and asynchronous lessons

Two items measured students' preference over different online learning modes. Students agreed that they liked synchronous lesson where they met their teacher face-to-face online (M=3.64; SD=0.86). This was also confirmed by many students during the interviews. For instance, S4 said, *"I liked the lessons where I met my teacher face-to-face online. I liked it because I could clarify my doubts with my teachers and friends."* Another student had a different reason for liking synchronous lessons. *"I prefer Google Meet because I understand the lesson better when I have my teacher face-to-face online. It is like the teacher is teaching us in the classroom. Also, we can clarify our doubts immediately" (S2).*

In contrast, teacher's reflection in the journal clearly stated that many students did not turn up for synchronous sessions. Amongst 55 and 48 students, highest number of participations was 24 and 14 students respectively. There was an entry in teacher's journal with the statement, *"Around 14/48 students participated in Google Meet. Interesting interaction is possible." (Dated: 15/4/2020)*

They neither agreed nor disagreed about liking asynchronous lessons though responses deviated. (M=2.64; SD=1.09).   In regard to asynchronous online lessons, S1 claimed:
I liked the video lessons that could be watched without having my teacher face-to-face online. These lessons needed good Internet connection; therefore, it was expensive. Some of us could not afford the cost of the Internet. Comparatively, video lessons cost less and did not need Internet with high speed. If we had doubt, we were able to clarify it through private comment section.

Participant's preference amongst social media and Google Classroom for online learning

Seven items investigated students' preferences amongst the platforms for online learning-social media and Google Classroom. Most students disagreed upon liking social media (WeChat) over Google Classroom for online learning (M=2.50 SD=1.18). Students agreed that Google Classroom was easy to use (M=4.13; SD=0.85), enabled them to learn what their teacher taught (M=3.82; SD=0.97) and it enhanced their technological knowledge (M=4.00; SD=0.79). Findings from the qualitative data confirmed that it was easier for the students to use the Google Classroom. Initially, a student had problem using Google Classroom (S3).

She said, "*In the beginning it (online lesson) was difficult because Google Classroom was new but with time, I found it easy to use*." One of the entries in teacher's journal showed that social media is convenient to remind students about their work and to ask about their work progress but not to teach. Moreover, when students submitted work on social media, it was found difficult to keep track of their works and to assess.

In regard to social media, students neither agreed nor disagreed that it was easy to use (M=3.39; SD=1.04), enabled to learn the lessons (M=3.07; SD=1.04) and enhanced technological knowledge (M=3.09; SD=1.01). In the beginning, class six students did not have Google account so the teacher used WeChat to send lessons. On March 26, 2020, in her journal she commented, "*Could not load lengthy lessons. Had to send in short clips. The video was not clear.*"

Challenges of online teaching and learning

There were eight items to explore the challenges of online teaching and learning. Students agreed that the access to Internet was expensive (M=3.71; SD=1.04). A student said the same in a interview, "*I found the lessons (online) bit expensive because of the Internet cost*" (S1). Nevertheless, they were able to afford it (M=3.64; SD=0.92) and owned their own devices for online learning (M= 3.75; SD=1.16).

Other challenge faced by the students could have been time management issue. S2 said, "*I had difficulties managing time for my online lessons since I was watching television most of the time.*" Another student was distracted by his games on phone. He said, "*To be honest...I didn't write my assignments. I always felt like playing PUBG when I was with my phone. I was carried away by the game and hardly got time to do my assignments and watch video lessons.*" In contrary, S1 and S3 did not have issue with time management for their online lessons. Both never failed to submit their assignments and attended synchronous lessons. In addition, S3 said, "*My parents kept reminding about my online lessons.*"

Other findings from interview and teacher's journal showed that both teacher and students faced technical problems. S2 complained, "*Some quizzes were not able to open. I couldn't either choose or write answers.*" And the teacher stated following statements in her journal:
"*Most students did not learn from the video since I used YouTube video. They did not show time calculation work correctly so got to teach again.*" (Dated: 27/8/2020)
"*Lack of knowledge hindered to solve students' challenges so asked the co-author for*

assistance. He conducted an online class for me. He taught students about blogging and how to create it." (Dated September 1, 2020)

Students disagreed upon feeling neglected by their teacher (M=2.14; SD=0.96) and other students (M=2.43; SD=0.99) online. They refused of feeling lonely (M=2.36 SD=1.01), not being able to comprehend the lessons (M=2.30; SD=0.81) and feeling of dropping the schools (M=1.84; SD=1.06) because of the online learning mode.

Teacher's journal entry stated, *"constant reminder is required for some students to write their assignments. Despite all the phone calls, most failed to submit their assignments. So, need to make a call to their parents."* (Dated June 4, 2020)

Discussion and conclusion

MoE (2019) stated that Bhutan envisions at enhancing ICT integrated teaching and learning resources and ICT-competency of the teachers and students. This pandemic was a milestone in the Bhutanese education system where schools began to adopt online teaching and learning and gave teachers an opportunity to explore and integrate ICT. Both teachers and students used different ICT tools and online strategies to teach and learn.

In line to Sun and Chen (2016), the findings of this study showed that, in order to have an effective online teaching and learning, organized content, collaboration and support for students were found vital. Above all, teacher plays a crucial role in executing effective online lessons. Technologies do not fully replace teacher. Teacher has to design lessons and assignments, motivate students, respond to and evaluate students' works. Hence, professional development and teamwork should be a continuous process to help the teachers with their newly acquired technology skills (Harris, et al., 2016). The findings from this study corroborates with the earlier findings of Choden and Sherab, (2019) and Sherab, et al, (2022) that there is a genuine need for professional development programs related to technology and ICT.

Similar to the school teachers in Indonesia (Rasmitadila, et al., 2020), Bhutanese teachers used different technologies and tools to teach during the pandemic. Common tools used were Google Classroom, social media such as WeChat, WhatsApp and Messenger self-created video lessons, worksheets, YouTube, and Google Forms. The study with Indonesian teachers did not specify the kind of software used for creating video lesson, but this study used Camtasia. It was found helpful in presenting the lesson and minimizing the file size which at the end helped learners to access the tool.

Both synchronous and asynchronous mode of online learning could be significant to cater to needs of different learners. In concurrent to Kado, et al. (2020), this study showed that Google Classroom has significant features to carry out both synchronous and asynchronous activities. Students of this study evidently indicated their own choices over the two. Some preferred synchronous and other asynchronous aligning to pros and cons of respective modes. Cleveland-Innes and Wilton (2018) posit synchronous learning is advantageous for immediate feedback system and adjustments to skill and knowledge, and brainstorming. Nevertheless, it demands advance technical infrastructure and skill of teachers and students.

Asynchronous learning is advantageous for students to have flexible learning environment, they get time to research and reflect on their lessons to respond thoughtfully and elaborately. Nevertheless, in an asynchronous learning environment, students might feel isolated since there is a lack of connection amongst the students or with the teacher (Cleveland-Innes & Wilton, 2018). Thus, as advised by Bao (2020) a combination of both with careful planning of activities is recommended.

Constructive learning environment could be implemented in online mode of education. Online lessons could incorporate activities that enhance skills such as critical thinking, analytical thinking, and problem-solving. In addition, collaborative teaching and learning is stated vital for online mode and it could be incorporated through interactions amongst students, and teacher- students. These skills and strategy are necessary for 21st century. Moreover, prior studies posit these features significant for online mode of teaching and learning (Bao, 2020; He, et al., 2014; Sun & Chen, 2016).

He, et al. (2014) found retaining students in online courses challenging. The student attrition rates increased by 10 to 20% for studying online. Although this study showed that the students did not have an intention of leaving their learning, teacher did face difficulties in having 100% student participation. In Bhutanese context, students take their learning seriously when their works are assessed. They worry mostly about promotion and detention. Therefore, in order to retain students in online courses, it is essential to take proactive actions such as developing timely pedagogical interventions, effective early warning system, and provide formative grade feedback (He et al., 2014).

Online mode offered flexible learning environment and time for students to learn. However, learners faced challenges in dealing with technical difficulties as found earlier by

Dhawan (2020). Similarly, Bhutanese students faced difficulties operating technologies initially, nevertheless, gradually they adapted to the novice mode of online learning. Also, they had issues managing time and having distractions online such as playing games. This indicated that students did not lack knowledge on technology operations rather it was the issue of lack of self-discipline and good learning environment at home (Bao, 2020).

A report on education in emergency during the pandemic in Bhutan (Education Monitoring Division, 2021) showed that parents at home needed education on managing time and guiding children during the pandemic. Not just parents but this study showed that students too needed an education on time management, so they are not distracted by games while studying online. Moreover, such education might help them in disciplining themselves and becoming responsible for their own learning.

Recommendations

With the evolution of digital technologies, it is evident that schools in Bhutan embrace different forms of e-Learning. Teachers need to be updated with different kinds of technologies that could be used effectively for teaching online rather than being dependent on traditional classroom mode. They have to be proactive and keep learning continuously for students despite any sort of crisis that would make regular schooling impossible. Therefore, teachers need to work extra hard and acquire adequate technological knowledge.

This study confirms that online teaching and learning could be successfully implemented in Bhutanese context if both students and teachers put in the same effort. Students too need to cooperate with their teacher and manage their time for online learning. Also, parental support is vital in providing all the necessary support both morally and financially. If all these factors came together, online mode of education could achieve the goals of catering to the learnings of the students. Similar to the findings of DeCoito and Estaiteyeh (2022), this study also confirmed issues related to the feasibility of traditional mode of assessment such as written and verbal feedback, and quizzes in online teaching. These modes hardly suffice the required components for assessment 'as' and 'for' learning. Therefore, there is a need of effective assessment strategies and techniques for online teaching and learning in future studies. This would help not only the Bhutanese teachers but also teachers worldwide. In addition, future researchers could duplicate the intervention strategies with controlled and treatment groups to investigate the effectiveness of online mode of teaching and learning. They could also experiment with subjects other than social studies and English.

Limitations of the study

This action research was designed to try out a self-designed intervention strategies based upon concept of scholars to teach online. Like any other studies, this research too has its own limitations. The study is about one teacher's practice administered with her class six and seven students. Findings could be biased and would not be wise to generalize. Moreover, this study did not have tools that could infer causal impact.

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