Challenges of Online Teaching during COVID-19 Pandemic and Lessons Learned

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Abstract

This study explores the existing ICT competencies of high school teachers in online mode during the COVID-19 pandemic. It also identifies the challenges and opportunities faced by school teachers in teaching and learning. The study followed the mixed method (QUAN-qual) research design. A total of eighteen teachers have been selected purposively at Kirtipur municipality. A set of questionnaires and an in-depth interview guideline were prepared for data collection. The quantitative and qualitative data were analyzed by using the SPSS software version 20 and the verbatim and thematic methods. The obtained quantitative data were interpreted by using statistical tools like correlation and the significance through Spearman's Rho rank-order correlation coefficient bivariate analysis. The result showed that almost all teachers had the basic knowledge of ICT tools and the knowledge for handling them. About 72 percent of them used Zoom and the rest 28 percent of them used other software like Microsoft teams and messenger. The popularity of using the face-to-face lecture method of teaching, problems with internet access and laptops, and inadequate ICT-friendly environment are the major challenges for online teaching and learning.

Keywords*:* COVID-19 pandemic, ICT pedagogical skills, online teaching

Introduction

In December 2019, an outbreak of pneumonia of unknown origin was reported in Wuhan, Hubei Province, China (Bubb and Jones, 2020; Dhawan, 2020; Hash, 2021). Pneumonia cases were epidemiologically linked to the Huanan Seafood Wholesale Market (Dhawan, 2020). Inoculation of respiratory samples into human airway epithelial cells, Vero E6 and Huh7 cell lines, led to the isolation of a novel respiratory virus whose genome analysis showed it to be a novel coronavirus related to SARS-CoV, and therefore named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is a betacoronavirus belonging to the subgenus Sarbecovirus.

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The global spread of SARS-CoV-2 and thousands of deaths caused by coronavirus disease (COVID-19) led the World Health Organization to declare a pandemic on 12 March 2020. As a consequence, the Government of Nepal also declared a lockdown in the country; and thus the schools were temporarily closed for nearly two months. From the second week of May 2020, UNESCO estimated that nearly nine million (8,796,624) students in Nepal were affected due to school/university closures in response to the pandemic (Dawadi and others, 2020). Out of this number 958,127 (11%) were pre-primary, 2,466,570 (28%) primary, and 3,463,763 (39%) secondary-level students. Because of the closure of schools for a considerable period of time, the educational delivery system has changed dramatically, with the rise of online learning whereby teaching and learning were undertaken remotely and on digital platforms.

In the context of COVID-19 and its challenges in teaching and learning, World Health Organization (WHO) declared COVID-19 as a global public health emergency of international concern on 30th January 2020, as well as a pandemic on 11th March 2020 (Dhawan, 2020). As of 6th April 2020, UNESCO reported that there were 1,576,021,818 affected learners in all levels of learning; and this population consisted of 91.3% of the learners enrolled in 188 countries.

As in many other aspects of everyday life, COVID-19 had a serious impact on students, instructors, and educational organizations around the globe (Gillis, and Krull, 2020): the pandemic caused schools, colleges, and universities across the globe to shut down their institutions (König, Jäger-Biela, and Glutsch, 2020) and quickly move conventional education to distance and virtual learning (Dhawan, 2020; Carrillo, and Flores, 2020). Due to the uniqueness and exceptionality of past and current circumstances, many studies are emerging on the impact of COVID-19 restriction measures in different educational levels (Adedoyin, and Soykan, 2020) and different contexts (Quezada, Talbot, and Quezada-Parker 2020). Most of these studies focus either on specific countries (Assunção Flores, and Gago, 2020) or on specific aspects, such as technical aspects of e-learning (Carrillo, and Flores, 2020) or psychological impact (Baloran, 2020) or communicative perspectives (Gillis, and Krull, 2020).

COVID-19 pandemic created problem among teachers and students in schools – with no minimal infrastructure to run online classes in the initial stage of the pandemic (Sigdel and others, 2021). Also, high school health and population teachers were lacking the basic skills to teach online. Moreover, school teachers in Nepal have insufficient knowledge and techniques for students' engagement during online teaching-learning. This is a reason that the achievement of students in Nepali schools is 'below policy expectation' (Acharya et al., Forthcoming). Students' low achievement can be upgraded by connecting learning with the arts (Acharya, Acharya & Khatri, Forthcoming). Access to

the internet and internet connectivity was a major issue (Subedi and others, 2020). Arguing for this finding, Acharya, and Acharya (Forthcoming) find that collaborative learning is a must to uplift students' performance.

There was no uniformity in conducting online classes during the pandemic. During the lockdown, Tole education (cluster teaching), community visit and learning, learning in the *chautaras* (the shades of big green trees), radio broadcasting, learning from TV, and so on were the approaches to online teaching and learning in Nepal. In the later days, online learning from mobile, radio, television, YouTube channels, recorded lessons, and digital educational resources were combined together to provide lessons to students who did not have reliable access to the internet. Khati and Bhatta, (2020) stated that radio, TV channels, and YouTube videos were the means of learning. In the post-COVID pandemic, the Government of Nepal applied a learning management system as well as digital lessons, and electronic textbooks.

At present challenges as well as opportunities are identified for high school teachers to teach online during the COVID-19 pandemic in Nepal. Based on the analysis of primary data, the article shows the situation observed and reflects on the nature of the effect of COVID-19 on the public schools of Nepal. As there is a lack of adequate research in order to determine the actual impact of closures on education, this article is an attempt to investigate the consequences and opportunities of formal closures of schools in Nepal.

Objectives of the study

This study was undertaken to fulfill the following objectives:

i. To find out the existing ICT competencies of high school teachers during the COVID-19 pandemic;
ii. To explore the challenges and opportunities for high school teachers in using devices for teaching and learning online.

Methodology

A mixed-method (QUAN-qual) research design was used in the study. Quantitative data were collected through the questionnaire from the eighteen public high schools located in Kirtipur Municipality. The data were analyzed by applying Statistical Package for Social Science (SPSS) software version 20. The collected quantitative data were analyzed and interpreted by using statistical tools like percentages, dependent variables, and the Likert scale and converted into the sum of the total score through mean and standard deviation with the non-parametric test. The correlation coefficient and significant values were also calculated by the use of Spearman's bivariate correlation. The

qualitative data were collected through in-depth interviews with eight teachers from the sample schools. Eight schools and eight teachers were selected through purposive sampling for the qualitative part of this study. Qualitative data were analyzed through the verbatim and thematic method of data analysis.

Result

The competencies of teachers and the knowledge of ICT of the study population show that most of the teachers do not have sufficient ICT skills although they have higher qualifications. The result shows that more than 90% of teachers have basic ICT skills to conduct online teaching and learning during the COVID-19 pandemic. The data also shows that 52.8% of teachers did not take any ICT-based training, and the remaining had taken ICT training for online teaching and learning. It is found that despite having higher degrees to teach and recruit at secondary school, they lack adequate ICT pedagogical skills. However, they have basic ICT skills for teaching online at high schools.

Use of Tools for Online Teaching and Learning

Almost all the teachers have taken classes through the use of mobile phones. More than 80% of them used Wi-Fi internet and more than 90% of them used Zoom software to take online classes (Fig. 1). Some teachers used Google Classroom as well.

Figure 1. Use of ICT Tools and Facilities during Online Teaching
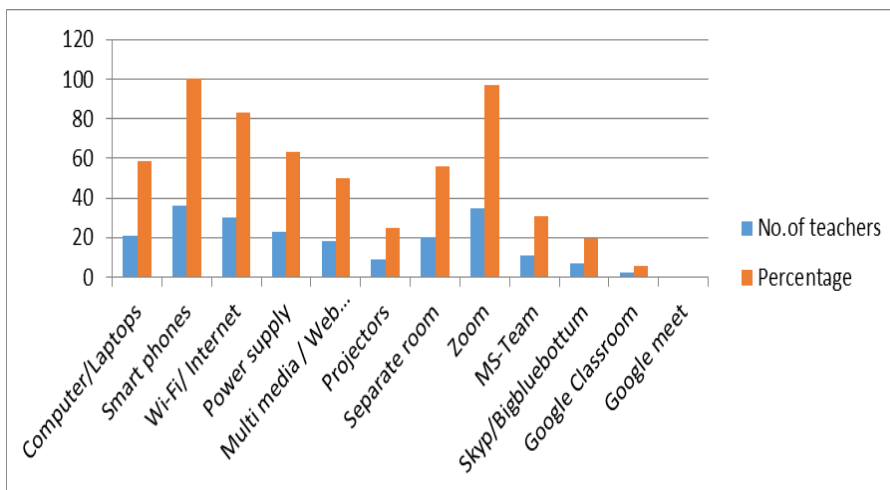
It is found that a maximum number of teachers used smartphones and Zoom for taking online classes during the lockdown (Fig. 1). On the other hand, the least

number of teachers used Google classes and Google meets during teaching and learning. It shows that access to smartphones among high school teachers in Nepal is good.

Competency in using ICT for Online Teaching and Learning

ICT competencies related to the use of Microsoft applications, social sites, and Self Learning Materials (SLM) items were measured using a 3-scale Likert rating. It is found that the MS Office application package is preferred by more than two-thirds of science teachers. Facebook and email are used by almost all teachers with insufficient skills in social sites. As a result, more than 75% of the teachers were not used to SLMs such as Moodle or others during online teaching and learning. However, more than two-thirds of teachers used e-books and e-libraries as e-sources of learning.

It is also found that the correlation between teachers' ICT competencies (independent variable) and the other three dependent variables like the age of teachers, training qualification, and previous use of ICT among teachers. According to Spearman's Rho correlation, ICT competencies have modest negative relation (Rho is -0.336) with the age of teachers. But the result was significant as p was 0.045 i.e., (p<0.05). Similarly, the qualifications of teachers and previous use of ICT had a strong correlation with ICT competencies following the values of Rho as 0.674 and 0.833 respectively. Also, the result obtained was highly significant as p was 0.000 i.e. (p<0.05). The result hence explained that competency of ICT had a strong association with younger age of teachers with ICT qualifications and previous use of ICT access in teaching.

Further, table 3 expressed the correlation between teachers' ICT competency (dependent variable), and the other 3 independent variables like teaching experience, training qualifications and use of ICT-based pedagogy. Application of Spearman's rho rank-order correlation coefficient of bivariate analysis of statistical (Muijs, 2014) methods converts into continuous data of total scores of science teachers' competency, supportive online activities and challenges.

Table 1. ICT Competencies among High School Teachers

Descriptions	N	Range	Maximum	Minimum	Mean	Std. Dev
ICT competencies	18	26.00	30.00	4.00	18.75	7.32
Supportive online activities	18	18.00	18.00	.00	9.22	4.87
Online Challenges	18	10.00	20.00	10.00	15.50	2.75

The result shows that Spearman's rho correlation, online supportive activities have modest negative relation (rho is -0.233) with the age of teachers. But the result was not significant as p was 0.172 i.e. (p>0.05). Similarly, the training qualifications of teachers and previous use of ICT had a strong correlation with

ICT competencies following the values of rho as 0.652 and 0.826 respectively. Also, the result obtained was highly significant as p was 0.000 i.e. (p<0.05).

The result hence explained that online supportive activities were not allied with the age of teachers' strong association and significant with ICT qualification and previous use of ICT access in teaching. Thus, online supportive activities have a vital role in the improvement of the modern need for online patterns of teaching practice.

Prospects and Challenges of Online Teaching

The academic activities and performance of the schools and students are determined by the structural, personal, and functional characteristics of the educational institution. Physical, academic, and social factors are associated with the school environment. The informants were asked about the school environment that affects students in accessing their learning activities. Regarding the school environment, teachers said:

> *The lockdown shortened the teaching hours, and the students need to complete the curriculum in a limited time frame. Hastened learning was a solution but concerned authorities did not adequately train the teachers. Also, there was a problem with the evaluation of students. There were no clear-cut guidelines in the assessment of students during the lockdown. It was difficult to recover learned knowledge and scale up the ability to learn in the upcoming days.*

During the lockdown, the government tried to manage a safe school environment by framing policy and managing framework. Also, guidelines were prepared to continue teaching-learning and curriculum reframing and also use alternative teaching modes during school closure and reopening. According to one of the teachers, students suffered from some major challenges like the lack of budget to purchase ICT devices, classroom size for maintaining the distance between students, difficulty in maintaining safety measures, and fear of transmission of diseases.

Likewise, another secondary school teacher said:

> *We faced difficulty to make students active in teaching-learning activities. When we started to run classes physically by maintaining distance, there was a lack of benches, classes, space, and size of the black/whiteboard; teachers had to write larger letters on the board. Our resources were lacking to meet the needs of teaching-learning activities when the school reopened after the lockdown. It was a challenging time for us to maintain physical distance in the school.*

In this line, another female teacher shared her opinion:

There was grass and dust everywhere in the school when the school was reopened. The school was not clean. Benches and desks were covered by dust. It needed to clean daily. On the first day, we cleaned the school rooms and benches because it was covered with dust, dirt and grass. The school environment was different from the pre-COVID-19 period.

Similarly, another female teacher mentioned:

At first, the school atmosphere was not good but later I liked it. At first, the school environment was dirty due to the long closure. But later it was cleaned. I was happy to take classes as I got bored staying at home all the time.

According to a female teacher, lack of budget and ICT materials is a critical issue in schools. COVID-19 was not taken seriously by the people. Maintaining physical and social distance brought challenges for school resources and learning. The budget was a major problem. However, teachers did not feel burdened to teach using alternative classes. In later days, the level of fear gradually decreased because there was no such fatality due to COVID-19. It was difficult to resume teaching-learning since the classroom size was inappropriate for maintaining physical distance; and there was difficulty in maintaining safety measures.

Similarly, the teacher who had almost twenty years of teaching experience opined:

Students are not mentally prepared; motivation is not enough to mobilize. Teachers were not seen much responsible during the school closure. Rather they took this closure as their regular leave. The school was not free to take the necessary decision for school opening and choosing alternatives.

During school closures due to the COVID-19 pandemic for long period, there was not adequate preparedness to take online classes. It was due to budget constraints, lack of infrastructure, and fear of transmission of COVID-19. Also, the schools could not keep the environment neat and clean. The use of alternative modes of teaching caused problems for students in accessing learning activities and continuation of learning.

In the same way, teachers said that the widespread adoption of ICT in society has had no effect on the classical postulates, which continue to emphasize the importance of the human factor. As a result, teachers' professional attitudes should strive to maximize their benefits while minimizing their rejections,

allowing them to be included in instructional practices that promote training and educational advancement. Capability building of teachers and their willingness plays an important role which was another challenge.

Likewise, one of the teachers argued:

> *Teachers were not aware of ICT, proper teaching-learning materials were not available; and the internet was not available which makes it very difficult in teaching. Poverty hits differently at that time. We wanted to do good things but due to a lack of materials, we could not do anything.*

Furthermore, a teacher viewed:

> *I feel the virtual program is not satisfactory. Moreover, teaching-learning and training cannot be effective through virtual mode compared to face-to-face teaching. For example, learning by seeing and doing is more effective than hearing. We can't expect success at all, but we are satisfied with the program that we launched.*

Teachers argued that technology overload can reduce the favorable association between online learning and basic needs satisfaction during the COVID-19 pandemic in Nepal. From the perspectives of most of the teachers, it is revealed that they have less competency in the modern art of teaching. Also, they do not have sufficient knowledge of using online teaching since they have no training in ITC and online teaching. Indeed, the mere use of ICT does not guarantee optimal results, and teaching innovations may well come from other initiatives and areas. The experience of the teacher, their intellectual capacity, and mastery of the pedagogy may undoubtedly be much more effective than the mere application of theoretical proposals from contexts outside the daily educational reality.

In an effort to prevent and control the spread of the COVID-19 pandemic, the Government of Nepal halted all educational institutions indefinitely. Alternative teaching approaches are the only way to keep kids learning in this situation. During lockdown and after the announcement of the reopening of schools by the government, some resourceful and facilitated public schools have run online classes even in high schools as an alternative teaching-learning mode. But many community schools could not run classes using online because of financial constraints, lack of ICT facilities and skilled teachers in schools. Many schools did not even conduct classes using alternative modes due to the constraints of the resources. As a result, it was considered critical to provide teachers with training in alternative pedagogies.

In this perspective, the teachers were asked about the use of alternative modes during school closure and reopening after school closure. The following

verbatim shows the situation of online teaching as a part of an alternative teaching-learning mode. One of the teachers (he is also the head teacher of the school) told:

We could not prepare teachers to take online classes when the schools were closed. We could not provide resources like the internet, electricity, and other devices. Due to the sense of insecurity of the expensive material resources in school, such things could not be managed.

Likewise, another teacher said:

We say we will go through the virtual online mode for the teaching-learning process but it was not possible due to the lack of access to the internet in school and students' homes. Even radio and TV education were not utilized due to the lack of regularity of electricity.

Another teacher from a high school conveyed:

In our school, we do not even have a desktop or a laptop. Teachers are also not IT-friendly. Most of the teachers do not even have their email addresses. How can we teach via online classes in such a condition?

In relation to the application of ICT, one of the teachers added:

Digital learning was the best alternative method during the lockdown and prohibitory orders. Still, digital platforms such as laptops, tablets, mobiles, the internet, and television were not accessible to all the students. Also, those who were accessible were not skilled enough in their use, and the teachers were not good at using such platforms. Due to the limited mobility during the lockdown, it was also not feasible for teachers to provide home-school support.

Similarly, another teacher said:

It is not intentional; some activities could not be completed on time due to resource limitations and work processes in the local government. EMIS data are very useful for educational planning, but they could not be accurately available, which may be due to the Head Teacher's low technical capacity, which created problems.

In the same way, another teacher said:

There are many barriers to continuing learning even after the lockdown. First of all, only a limited number of students came to school. Parents complained that the school wants to exterminate our students by opening the school. We convinced them by promising the safety measures adopted in the school. Sanitizers, face masks, and thermal guns were used as safety measures. Gradually, parents were convinced and we were able to run classes normally.

Teaching without a book could not be effective in our area. The online class was possible but even if parents had mobile phones, they did not have Wi-Fi. Running an online class through a data pack was too much expensive and not possible. Another challenge was that people had no trust in anyone. When the teacher went to the student's home, the parents had a doubt about the possibility of transferring the virus. The students could not go outside. Providing stationeries also was not possible as shops were closed. Students could not exchange with peers too. Sometimes they did not have the technical skills to handle ICT.

Supporting this concern, one of the teachers said:

> *The telecom network is not strong and there is no access to the internet all the time. So, it is difficult to support learning during the COVID-19 pandemic time as the students were at home.*

Similarly, a teacher expressed:

> *We did not have access to any alternative materials/ platforms during the COVID-19 pandemic except TV. The classes from the TV for any level were not effective. The telecom network is not strong and there is no access to the internet. Due to the geographical situation, students were scattered in a large geographical area. So it is difficult to support their learning during the COVID-19 pandemic time.*

The information related to ICT facilities from the respondents from all districts revealed that most of the schools have no ICT devices such as computers, laptops, the internet, smartphone, and Wi-Fi. Even though only a few have TV and radio, TV programs were not used. Also, almost all students do not have access to ICT facilities at home for online learning. Alternative teaching-learning virtually is not possible in community schools. Also, there were problems with the distribution of self-learning materials and other learning materials. Even textbooks and self-learning materials were not sufficient.

It is revealed that most of the students in different districts facing problems in community schools are from backward and low economic conditions and families with less privilege in accessing learning during school closure. There were challenges during COVID-19 as participants were deprived during the lockdown. Due to the spread of COVID-19, the local government had to take the risk to open or close the schools. Taking decisions during the COVID-19 period was really challenging. Since this was a new situation to cope with, it created some dilemmas, confusion, and a state of fear of taking decisions immediately.

Discussion

This study explores how digital tools have been used and what challenges and opportunities of online teaching and learning prevailed during the COVID-19 pandemic. It also explores how public school teachers experienced online learning, the impact on their mental well-being, and the constraints and challenges faced by both teachers and students during online learning. The subject teachers and students in school carried out object-oriented activities mediated by the use of digital tools. The teachers' activity system engages students in online learning, and the object of the students' activity system is to get engaged in online learning during the pandemic. The widely used digital tools are Facebook, Zoom, Google Meet, emails, and Messenger groups; and laptops and smartphones were the widely used digital devices. One of the interesting findings is the context-sensitive use of a digital tool while transitioning to online teaching and learning. For instance, since the teachers in Nepal have no access to the standard LMS in local contexts, they seem to have created their self-designed LMS using Messenger group, which corroborates the findings of Pokhrel and Chhetri (2021) and Liguori and Winkler (2020), who found that, in the absence of standard LMS, teachers use inexpensive and widely available tools to personalize instructions. What is surprising is that teachers have identified the very distinct potentials of this social networking tool, Messenger group, which is primarily created for chatting purposes.

Participants had informal communication in the Messenger group and established this as a platform to share information and documents related to their academic activities. Thus, the self-created rules agreed upon by their own community to operate a digital tool seem to be helping them to carry out the object-oriented activity. In line with Rashid and Yadav (2020) who contend that digital tools provide novel, creative, and entertaining learning contexts, the teachers could rightly identify the action potentials of the digital tools they used. Another unanticipated finding is that many teachers and students planned to use digital tools after the COVID-19 crisis context. The likely cause for this is the training they received during the pandemic, and their perceived usefulness and satisfaction. Kapilan and others (2021) found that the perceived usefulness and satisfaction of learners in school education improved the adoption of digital technologies for teaching and learning. Their plan to use digital tools in the future may also be influenced by personal expectations, as these types of expectations significantly influence students' continuous intention to use digital tools and the learning management system (Saxena and others, 2021). This finding implies that blended learning will get normalized in school settings. It is equally intriguing that a large number of teachers use online resources created by the online community and seek advice from the

ones who have more online experience. They rely on each other and act as a community in a way that is comfortable for them during this transition.

The members of the community also play a very crucial role in helping each other and mitigating challenges that emerge while performing certain actions during teaching online. The primary challenges both teachers and learners face are limited access to the network, power cuts, issues related to learner engagement, possession of low-end devices, and lack of competence to handle web tools and online resources which are in line with the findings of Dhawan (2020) and Shamir-Inbal, and Blau, (2021). The contradictions in activity systems emerge due to these challenges; such as there is an aggravated contradiction as teachers do not have access to a good network, yet they have to engage learners in teaching and learning. Likewise, learners' engagement is not in line with teachers' anticipation even if teachers try to achieve this. In such a scenario, the contradiction is between teachers' and students' activity systems. Laloo and others (2020) argue that the contradiction between two activity systems is a quaternary contradiction. Teachers searched for alternatives and used technology as they saw in their local contexts, even in an unconventional manner (i.e., use of social platforms such as LMS) which also corroborates with the findings of Dhawan (2020). The lack of policy to guide the use of digital technologies also emerged as one of the challenges, which corroborates the findings of this research.

Conclusion

The article has analyzed the impacts of school closure due to the COVID-19 pandemic on education, pointed out some of the challenges arising from the closure, and some responses on the closure as well as opportunities to learn using the ICT tools during the pandemic. It is evident that the COVID-19 pandemic created some sort of educational lawlessness when the government had no firm grip on the educational system. Since the majority of students had almost no access to technology, the new measures capitalized on low-tech approaches, and also provided some e-learning platforms to those students who had access to technology. This means the new strategies to mitigate the impact of COVID-19 should range from hi-tech alternatives (such as real-time video classes conducted remotely) to lower-tech or no-tech options such as information through post offices and educational programming on radio.

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Authors' Contribution

MA prepared tools, collected data, transcribed, interpreted the data, and drafted the manuscript. KPA provided scholarly guidance and corrected it to improve the quality of the manuscript.

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