

The Impact of E-Learning during COVID-19 on Study Performance

An Sita, Nuon Renborey and Sorn Tithynika

INTRODUCTION

The COVID-19 pandemic has forced millions of students out of schools worldwide. The case of Cambodia is not an exception to this situation. As the start of the Coronavirus in 2019 has caused public health awareness (Subedi *et al.*, 2020), the spread of the virus raised concerns for schools and universities to shut down. Countries in almost all regions around the world closed down their schools as a part of the preventive measures to control the virus. The virus has not only affected education but also socialization. As Cambodia has experienced the presence of the virus, the global pandemic has turned everything upside down; hence, its effect on Cambodia's education sector is not surprising.

Cambodia's first confirmed case of COVID-19 occurred in late January 2020. With a second case in early March 2020 in Siem Reap province, home of the renowned temples of Angkor Wat, the Ministry of Education, Youth and Sport (MoEYS), in an abundance of caution, closed the schools until further notice. All of Cambodia's 13,300 schools have been closed since March 16, 2020, leading many students to seek distance learning opportunities to continue their education. To respond to this crisis, United Nations Children's Fund (UNICEF) has been working closely with the MoEYS in Cambodia to establish continuous learning activities from early childhood through to primary, lower, and upper secondary education. Distance learning assets, including videos and e-lessons, are being broadcast on various social media platforms, television and radio, aiming to reach every household in Cambodia. E-Learning is a type of learning or teaching platform that depends on electronic devices and technology instead of papers and classroom teaching. Thus, with the outbreak of the COVID-19 pandemic, students had to meet teachers online for learning.

In Southeast Asia, like in many other developing regions, a large segment of the population doesn't have access to the internet and electronic devices. And even people with access to the internet, experience some infrastructural division. The infrastructural gap can be seen through several circumstances, including the discrepancy of the internet's speed in different regions. People in the city centres often enjoy significantly

faster internet as compared to those living in less developed areas. Thus, as widely felt, not all students have access to high-speed internet and even those with high bandwidth internet have experienced interrupted service or a slow down due to high collective consumption. This may be due to the fact that more people have started using the internet to work, socialize, and entertain themselves during the lockdown. Another issue is relating to the cost involved in using the internet facilities. Although data packages on mobile networks are relatively faster, they are far more expensive for students to afford on a regular basis. However, according to Digital Datareportal Cambodia (2020), there were 9.7 million internet users in Cambodia in January 2020, and the number of users has increased by 1.3 million (15 percent) between 2019 and 2020 along with internet penetration in Cambodia, which stood at 58 percent in January 2020. Despite the familiarity of most students and learners with the technologies, it has been realized that not all can adapt to the new, modern ones. Therefore, there might be challenges and difficulties for the students who have not had much experience with the use of modern technology. Against this backdrop, our chapter intends to understand the significance and usefulness of the new technology along with the impact of e-learning on the study performance of the target group during the COVID-19 pandemic. In specific, we intend to achieve the following objectives:

1. To analyze the importance of e-learning during the COVID-19 pandemic.
2. To explore an e-learning environment based on practice during the COVID-19 pandemic.
3. To identify the relevant factors that affect the study performance of the target group.
4. To explore the ways through which improvement in the learning of the target group of students could be possible during the COVID-19 pandemic.

LITERATURE REVIEW

Impact of E-Learning on Students' Grades and Thinking Skills

E-learning has an impact on both teachers and students. Without good preparation, the use of technology may become a challenge or a serious problem. As Motah (2007, p. 483) mentioned, "due to the introduction of new and more sophisticated approaches to dealing with information, communication, and education, technology not only has an impact on schools, but on the society as a whole; everyone is using or having access to the internet, email, or websites for the information that they need, or for communication and knowledge." In higher education, technology has an impact on the students' academic achievement, course completion, or degree achievement (Nora & Snyder, 2009). Students need access to technology to seek new information and new knowledge from the outside world. Even if they are sitting in one place,

with internet access, students can explore more than the information that they need. Nonetheless, to be able to access the internet and make use of this modern technology, everyone at least needs some background in computer skills. This has led to the computer skill requirement for students in order to enter colleges that adopt technology and computer systems. Today with the further enhancement of technology, learners and instructors are required to be proficient in computer skills to make use of technology and enhance their learning and teaching respectively.

Universities and higher education institutions have prepared better tools and materials to help students achieve their academic goals. The changes in classrooms and teaching methods are done for the purpose of student engagement in lessons and class activities. At the same time, students' performance plays an important role in their studies in order for them to achieve their academic degrees. This should be from the combination of the learning environment (Bonk & Wisner, 2000), students' class involvement, and the motivation that the students need for the distance learning despite the direct interaction. In addition, e-learning as well has an impact on students' grades and their level of thinking skills (Nora & Snyder, 2009). If students make use of the internet and technology, they will be able to support their studies: students can use the internet for their research, or they can exchange ideas with their peers through social media. Another discovery from the Nora and Snyder (2009) study is that students' attitude and level of concentration are from their internal selves as well as from the support from their schools and the surrounding environment. Students who have received enough support and had the skill of technology would find online or distance learning very enjoyable. And the inner motivation that they have would of course lead them in wanting to join the class. Despite the distance learning, they would enjoy just as much as they did in the classroom. Furthermore, a supportive environment and necessary tools/material support also have a good effect on students' grades and enhance their cognitive skills. In order to help students be familiar with new technologies, schools should provide training and other important information regarding the use of the new technologies. Moreover, not all students have the skill and the knowledge of new technologies unless there is an orientation or training by schools.

Also, during an assessment, when students who have studied through e-learning were compared to those who were actively taught in the classroom, it was found that those who did their quiz physically did better than those who did it online. The results of both assessments show that students who have their assessments online tend to have difficulty with technology and cannot finish their quiz or their assignment on time. However, in the classroom, students could do their quiz or assignment successfully. In addition, students who have their quiz done by computer and not in the classroom tend to have problems when there is unexpected technology involved; some students might not know how to handle it immediately and that causes the

students to lose the time and the focus on their quiz. As for the students who have their quiz done in the classroom either by paper or computer, they still have the chance to ask for support from their teachers or for other assistance from the Information Technology staff. There is a significant difference when doing the assessment in a different environment or when using different tools. In the classroom, students are able to depend on their teachers and those who are there to support them when there are any unexpected problems. Unlike so, an online assessment can cause students difficulties in case of a technological problem. Since technology problems are very unexpected and there is no one to support the students while they try to see how to handle or to deal with them, this might affect the students' assessment, performance, and their feelings toward the test and the subject that they are studying.

Challenges of E-Learning on Students' Study Performance

E-learning has been recognized as a powerful learning method which improves students' performance, knowledge, and skills. The technical issue is the critical factor that influences the implementation of e-learning as students face the problems of accessibility and usability. In other words, it might not be a problem for the students who can afford to buy modern devices, but for the students who are not able to afford the latest technology, it may be difficult to study in the same environment. Even when students can afford modern devices, it does not mean that there would not be any challenges when using them. It might happen that the devices face unexpected technical error or that the internet connection becomes unstable. The study from Favale *et al.* (2020) has revealed that technical problems have decelerated the online teaching and learning process. Although technology integration is essential in enhancing the quality of the education system, a good level of technological skill is always required. Their study has found that 26.86 percent of students have encountered difficulties in technical issues, including those having less experience in technology. Based on the study of Shraim and Khlaif (2010), students had difficulties due to having insufficient skills in using electronic devices. E-learning fully relies on strong internet connection; however, lagging internet connection due to a shortage of electricity has caused difficulties in the implementation of e-learning, especially for students in rural areas. More than 63 percent of the respondents got distracted with e-learning due to the cutting off of electricity and the loss of internet connection (Subedi *et al.*, 2020). Similarly, the study from Kapasia *et al.* (2020) has stated that more than 32 percent of the students in India had faced difficulties in e-learning due to the lack of internet connectivity.

Electronic devices have provided students the opportunity to learn more effectively through e-learning during the global pandemic when schools are closed. However, having insufficient tools to access online classes or other materials has been a challenge in this implementation. Students are struggling with limited resources or

gadgets, which is the problem in adaptation of e-learning. As mentioned by Dhawan (2020), the difficulty in e-learning is due to not having enough devices, equipment, or proper tools to access online classes, as it may affect learning opportunities. This struggle which distracted the online learning process from achieving its full potential is a challenge for individuals. The research conducted by Kebritchi *et al.* (2017) has considered learners' expectation and participation as the issues of e-learning. Students have different paces of learning which makes online learning an uncomfortable and non-preferable learning method for some of them and it would lead to confusion and a decrease in level of confidence (Dhawan, 2020). Based on the findings, more than 77 percent of students prefer a classroom learning style which makes them feel demotivated in an e-learning environment. In addition, Kapasia (2020) has stated that 12.6 percent of students in India have encountered the unfavorable learning environment at home which has caused the denial of e-learning, mainly from students in rural areas. During this pandemic, there is concern for the quality of education provided by institutes through online teaching. Shifting from physical classes to online mode was a challenge for education providers to design an effective teaching methodology which covered the syllabus and attracted students' attention in learning (Kebritchi *et al.*, 2017). According to Subedi *et al.* (2020), the full learning content was not understandable during their online class for more than 67 percent of the respondents in Nepal. Furthermore, there is a concern regarding the course content in which students, lacking physical communication, found difficulties in understanding instructions.

Solutions for E-Learning to Improve Students' Study Performance

Responding to the challenges of e-learning which students have faced during COVID-19 due to technical difficulties, pre-recorded video lectures and content testing are suitable solutions to ensure that the teaching-learning process is not hampered; these will make online courses more dynamic, interesting, and interactive. Along with efforts to humanize the learning process to the best extent possible, personal attention should be provided to students so that they can easily adapt to the e-learning environment. For example, teachers should provide assessments that involve group work, and other apps could be utilized to help attract and capture the student's attention. Moreover, social media and various group forums can be used to communicate with students; since communication is the key in reaching out to students via texts, various messaging apps, video calls, and so on—content should be such that enables students to practice and also hone their skills. Other than social media, there are also other apps that can help engage students in the classroom, which can actually increase the students' activity online and not let them feel bored during classes.

Another point is the quality of the courses. Course quality should be improved continuously and teachers must try to give their best to keep the lessons interesting

enough to not bore the students with the lectures. Hence, online programs should be designed in such a way that they are creative, interactive, relevant, student-centered, and group-based (Partlow & Gibbs, 2003). Furthermore, educators must spend adequate time making effective strategies for giving online instructions; as effective online instructions bring positive feedback from learners, they encourage learners to ask questions and broaden the learning horizon of the course content (Keeton, 2004). Institutions must focus on pedagogical issues and emphasize collaborative learning, case learning, and project-based learning through online instructions (Kim & Bonk, 2006). According to Gunawardana (2005), these strategies can keep students in line with what they had learnt and can alert the students as although they are studying online, their involvement and performance are as important as when they were in physical classrooms.

Computer-literacy is an imperative precondition for learners to benefit from technology-based learning. E-learning can only be built on a set of basic computer literacy skills, and learners should go through an introductory session for each programme that focuses on professional development in the use of technology in the classroom. In fact, Information and Communication Technology (ICT) can be a part of the solution according to Manir (2007). If education and capacity-building are critical steps for entering into the new global economic and educational development, e-learning should be considered a critical facet of basic development, an alternative medium of capacity-building, and a means to people's empowerment. Furthermore, since motivation can be defined as the extent to which persistent effort is directed toward a goal (Johns, 1996), learning motivation can be understood as the extent to which a student makes persistent effort toward learning. At the same time, motivation can be determined intrinsically by individuals and externally by sources taking into account situational variables and environmental factors (Amabile *et al.*, 1994). To overcome the lack of self-motivation for e-learning, students can better involve themselves and show up for all the activities and lessons during sessions and stick to their study schedule time in order to ensure effective learning. Plus, although it might seem difficult, it is also better for students to stay positive toward online learning. Since there is no other way but to adapt with the new learning style, besides thinking that it is a challenge, it might be good to think that it is a new opportunity to learn new things and be able to adapt with the new changes. The flexibility of e-learning is a solution to people's commitments to their family or work which may increase the number of people who enrol in this type of education. In fact, this goes beyond the learners; it also gives flexibility to the instructors. In addition, educational institutions are implementing e-learning technologies to improve the communication among learners and instructors for better knowledge exchange as well as to strengthen the learning community to accomplish personal goals.

Key Concepts, Theories and Studies

The adjustment of classrooms and teaching methods are to encourage students to be involved in lessons and class activities, meaning class activities and students' participation are both important for students' performance. Similarly, students' class involvement and motivation are what students need for distance learning (Bonk & Wisner, 2000). It appears that other factors, such as class activities and student participation also have an impact on student study performance. Additionally, Nora and Snyder (2009) have stated that e-learning has an impact on students' grades and thinking skills. For example, students can use the internet for their research and social media for their online discussions.

The increase in the number of students participating in distance education supports online learning as a substitute for traditional classroom teaching. Martin and Bolliger (2018) found that icebreaker/introduction and working with online communication tools were the most important engagement ways among learners, while sending reminders and providing rubrics for assignments were the most important and beneficial in learner-instructor interactions. Similarly, many students were satisfied with online education which further revealed that e-learning can support higher education in countries where higher education institutions are limited.

Key Debates and Controversies

Students who did their assessments online did not have an effective result since they tended to have problems with the technology and could not promptly finish the quizzes or assignments. It shows that e-learning does not only impact a student's grade and thinking skill, but technology difficulties also affect the student's performance.

On the contrary, students' perceived barriers to online learning have been documented. Administrative issues, academic skills, social interactions, technical skills, learner motivation, time and support for studies, cost, and access to the internet and technical problems were some of the challenges associated with online learning.

Students without reliable internet access and/or technology have struggled to participate in digital learning; this gap is seen across countries and between income brackets within countries. For example, whilst 95 percent of students in Switzerland, Norway, and Austria have a computer to use for their schoolwork, only 34 percent in Indonesia do (OECD, 2020). In the US, there is a significant gap between those from privileged and disadvantaged backgrounds: whilst virtually all 15-year-olds from a privileged background said they had a computer to work on, nearly 25 percent of those from disadvantaged backgrounds had not, and to be noted that some schools and governments have also been providing digital equipment to students in need such as in New South Wales, Australia (Basak *et al.*, 2016).

STUDY DESIGN AND METHODS

This is a descriptive study which aims to find out the impact of e-learning on students' study performance, explore the challenges that influence their performance in the e-learning environment during COVID-19, and seek an effective solution to improve their study performance during the current pandemic.

This study was conducted using a mixed research method by combining both quantitative and qualitative methods. Primary data for the study were collected from the target respondents (students of the CamEd Business School in their first academic year 2020) through an online survey by using Google Forms. Several questions were designed and administered with an intention to investigate the impact of e-learning on the target students' study performance. Through the qualitative method, we have tried to get a deeper understanding of the students' difficulties and their preferred solutions during the current pandemic.

Sample Design

In order to determine the sample size for this study, we have used the Yemen (1967) formula by taking into account the population of the first-year students of the July - December 2020 term. The formula used to determine the sample size is as follows:

$$N = \frac{n}{1 + Ne^2}$$

Where,

n = Sample size of the study

N = Total population

e = Margin of error

Considering the total population (N) size as 490, with a seven percent (0.07) margin of error (e), the sample size of the study was determined as 144. Further, on the basis of the gender representation in the total population, for this study, 95 (66 percent) female students and 49 (34 percent) male students were picked up randomly through lottery to conduct the online survey.

Research Instrument and Data Collection

To collect the required primary data as per the study objectives, a semi-structured questionnaire was developed, and the survey was conducted via online Google Forms with the sample students pursuing their first-year program. However, the questionnaire was pre-tested and finalized based on the feedback received from a few sample students. The qualitative data for the study was also collected through an online Focus Group Discussion.

RESULTS AND DISCUSSIONS

Primary data collected from the study participants have been processed to meet the requirement for further analysis. As mentioned earlier, the study has comprised 66 percent female and 34 percent male sample respondents.

Respondents' Experience of E-Learning Prior to COVID-19 Pandemic

We were quite interested to know whether the study participants have possessed any e-learning experience prior to the COVID-19 pandemic, and if so, to what extent. The purpose of knowing this is to get an idea about their background in e-learning. It is revealed from the survey that while more than one-third (35.9 percent) of the study participants had not possessed any previous experience of e-learning at all, above half (53.3 percent) of them had acquired some sort of e-learning experience before the pandemic. However, only 10.9 percent of the respondents have felt that they had a good understanding and experience of e-learning prior to the COVID-19 pandemic.

Respondents' Understanding on Factors Affecting Study Performance

We felt that it was important to know the kind of understanding the study participants have with regard to the factors affecting their study performance. Given the choices of factors, while more than one-third (38 percent) of the participants have felt 'attendance and participation', the lowest percentage (17.4 percent) have considered it as 'communication and discussion'. Among the remaining participants, 26.1 percent have felt that the study performance is greatly influenced by assessments and grades, and finally, for 18.5 percent of the respondents, it was the behaviour and attitude in the classroom that influenced the study performance of students. Similarly, in the Focus Group Discussion, the participants have felt that their study performance was greatly influenced by their class attendance, participation in the class discussions, class quizzes, exams including their attitude and behavior toward learning.

Regarding the effect of e-learning on the respondents' study performance, while more than three-fourths (77.2 percent) have expressed their agreement, the remaining 22.8 percent of respondents have considered e-learning to have no effect on their study performance. To know the factors other than e-learning that influence study performance, a majority (37 percent) have considered 'schoolwork overload', followed by more than one-fifth (20.7 percent) of the participants who have felt 'self-influence'. The other factors such as finance (15.2 percent) and access to study material (14.1 percent) were considered by the participants that too influence their study performance.

Thus, in response to the question that "what do you consider to be the most important way to assess your performance" as can be seen, e-learning does not only have an impact on a student's grade and assessment, but attendance and participation

has also played an important role. In addition, the implementation of online studies has revealed a negative effect as students' performance have dropped due to a loss of concentration to the lessons taught although a few of them shared positive comments. Besides, factors such as poor internet connections, system error, lack of motivation, and lack of active interaction with the instructors are some of the factors that impacted study performance.

Respondents' Consideration of E-Learning Importance during COVID-19 Pandemic

Almost all the study participants (95 percent) have realized and are quite aware of the importance of e-learning during the current pandemic. In response to why the respondents think e-learning is important during COVID-19, an equal percentage of the respondents (40.2 percent) have cited the reason of 'healthcare and individual protection' and 'learning without any worries.' For other participants, the reasons were saving time and money, and convenience to learn. One additional benefit of e-learning as felt by the study participants was that teaching and learning can continue in a situation where both teachers and students were not in a position to travel to the institution.

In the Focus Group Discussion, the participants have also felt that the strong benefits of e-learning are its ability to save time involved in travelling and it being safe in terms of spreading the COVID-19 virus. Learning is also faster and flexible as they can learn from anywhere with an access to the internet. Other benefits as felt by them were being encouraged to learn and to know the advantages of e-learning as well.

Respondents' Satisfaction as E-Learning Users during the COVID-19 Pandemic

Even though more than 95 percent of the study participants have felt the importance of e-learning during the COVID-19 pandemic, as far as their level of satisfaction is concerned, it has varied widely (Table 12.1). The results from the 7-point Likert Scale show that while 42.4 percent of the sample students were moderately satisfied,

Table 12.1: Levels of Satisfaction of Respondents as E-Learning Users

<i>Levels of Satisfaction</i>						
<i>Extremely Satisfied</i>	<i>Moderately Satisfied</i>	<i>Slightly Satisfied</i>	<i>Neutral</i>	<i>Slightly Dissatisfied</i>	<i>Moderately Dissatisfied</i>	<i>Extremely Dissatisfied</i>
11 (7.6)	61 (42.4)	31 (21.5)	33 (22.9)	3 (2.1)	2 (1.4)	3 (2.1)

Note: Figures in parentheses represent percentage to total sample respondents.

Source: Primary data.

21.5 percent of them were slightly satisfied. Again, around 23 percent of the respondents have preferred to remain neutral (neither satisfied nor dissatisfied). It is important to know that only around 6 percent of the sample students were found to be dissatisfied as the users of e-learning.

However, contrary to the findings that a majority of the sample students have been satisfied with e-learning, more than half (56.5 percent) of them have expressed that e-learning should not be used after the COVID-19 pandemic. They have strongly felt that physical classes encourage them to have more active involvement in interactions, discussions, and communication while they are at school. As commented by some respondents “studying at school is an excellent way to prepare ourselves to live in the society”. However, a number of respondents have also preferred the institution to offer them an opportunity to learn through both e-learning and physical learning.

Challenges Faced by Respondents as E-Learning Users

In spite of the satisfaction gained by the sample students as the users of e-learning, it has been revealed that the participants have experienced multiple forms of challenges in using technology as a mode of their learning. Overall, 70 percent of them have faced difficulties in some way or other. Toward understanding the challenges faced by the participants, it is found that while more than two-thirds (67.4 percent) of them have faced ‘poor quality of Internet connection’, above half (57.6 percent) of the participants have had challenges in ‘accessing Internet’, followed by 53.3 percent with other technical challenges (Figure 12.1). Likewise, in the Focus Group Discussion,

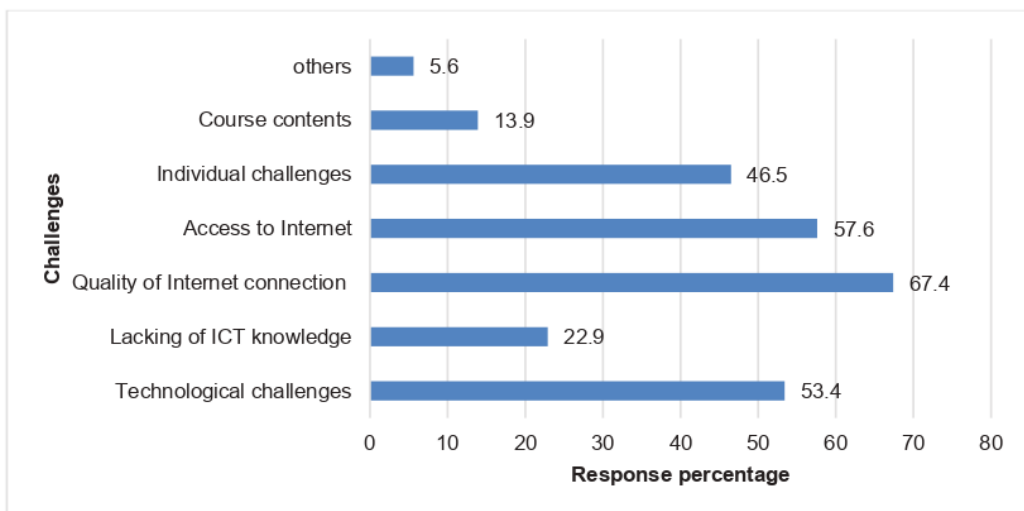


Figure 12.1: Challenges Faced by Respondents as E-Learning Users

Source: Primary data.

participants have felt that they lost their concentration in class due to poor and unstable internet connection, and this also affects their group discussions for doing some assignments. Further, they have realized that their interactions were limited during the online learning.

Thus, the challenges of e-learning encountered by the respondents are categorized as technical and individual challenges.

Poor Quality of Internet Connection

One of the most significant challenges faced by the study respondents was the poor quality of internet connection which distracted their attention from continuous learning and active participation in class activities. As revealed, more than two-thirds of the participants have felt this problem as a barrier to their learning process.

Limited Availability of Stable Internet Connection

During online learning, stable internet connection is required for accessing learning materials and sessions. As shown in the results, more than half of the surveyed respondents have expressed their problems in accessing stable internet connections. The problem becomes more serious during quizzes and exams when the stable internet connection is lost. This is a kind of distraction of e-learning which has resulted in poor study performance by some of the respondents.

Lack of ICT Knowledge

Nearly 23 percent of the surveyed respondents have expressed their inability to cope up with technical problems due to their limited ICT knowledge. They have viewed that their challenges with technical issues that occurred during the e-learning sessions, quizzes, or exams were due to their insufficient experiences in handling technology.

Individual Preferences of Students

As the pace of learning is different from one to the other, around one-fourth of the respondents have felt their preferences in classroom learning as being more motivational and encouraging. Limited interaction in e-learning is one of the significant factors for them to support in favour of physical learning.

Limited Learning of Full Course Contents

Though small in percentage, but close to 14 percent of the respondents have felt that e-learning has failed to engage them in a more effective way in certain course contents. A similar finding was found by Subedi *et al.* (2020) which had revealed that more than

67 percent of the respondents had considered the full learning content as not understandable during the online instructions.

Possible Ways to Overcome the Challenges

With regard to the challenges mentioned earlier, a few possible suggested actions were gathered from the respondents such as:

- Ensuring the stability of internet connection by the students through finding out their own suitable places from where they can learn without any interruptions.
- Making a provision by the institute to provide an extra course to students lacking ICT knowledge to improve their ability to use online applications and enhance their learning effectiveness.
- Ensuring to improve the quality of contents to engage the students actively in class participation and group discussions to make learning easy and encouraging.

CONCLUSION AND IMPLICATIONS

In its modest attempt, the study has revealed that e-learning has impacted students' study performance through their assessments and grades, participation, including their attitudes and behaviour. Based on the results of the study, the importance of e-learning during the presence of the COVID-19 pandemic has been well recognized. However, the difficulties and challenges involved in e-learning were felt by the learners.

The disruptions in internet connectivity, limited knowledge of ICT, students' learning preferences, and the lack of an active and engaged learning environment have slowed down the learning process, discouraged students, and brought certain amount of dissatisfaction to them to continue their online learning. To overcome these challenges, participants have suggested certain actions to make the learning process more active and enjoyable. Ensuring a stable internet connection to access the online classrooms, including participating in quizzes or tests, enhancing technical skills, and particularly ICT related knowledge and skills are required in an effective e-learning environment. It is also important to point out that the learners should stay actively involved in adapting to the new learning environment to maximize their learning benefits.

Keeping the importance of the study in mind, we recommend extending the study in terms of its geographic areas and number of institutions to generalize its findings and implications thereof. As the study had been conducted during COVID-19, to follow the protocol, we had opted for an online survey. However, future studies may be considered through a face-to-face direct personal interview with the respondents along with conducting physical Focus Group Discussions. However, in the absence of these, this study may be considered as an attempt to encourage other studies in the future in this direction.

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