

Opportunities and Challenges of Online Teaching: A Convergent Mixed Method Study on the Implementation of Online Teaching in the Colleges of the Royal University of Bhutan

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ABSTRACT: *The study addresses the transition to teach a curriculum designed for face-to-face teaching through a full mode online teaching. There has been infusion of online technologies in teaching contexts, and teaching practices globally, little attention has been given to online teaching and learning in Bhutanese higher education context. This study investigated the opportunities and challenges of online teaching in the colleges of the Royal University of Bhutan (RUB) using a convergent mixed method approach. Survey questionnaire and interviews were used to collect the data. 153 teaching faculties and 1206 students responded to the survey. 30 faculties and 30 students consisting of equal number of male and female were interviewed. Descriptive analysis and inferential statistics were conducted for the survey data. The quantitative finding reveals age, experiences, educational qualification and colleges as important predictors of efficacy in the online teaching learning and assessment practices. The results also show that lecturers and students were somewhat satisfied with lecturers' online teaching knowledge and skills. However, there are insignificant differences in the skills and knowledge possessed by both male and female lecturers and students of RUB colleges. Further, a positive correlation between lecturers' online knowledge and skills to online assessment, learning support and resources was noted while students' accessibility to online learning platforms and materials had lower correlation with other items. The qualitative finding indicates similar benefits and challenges related to online teaching. The study suggests respective colleges to support lecturers in their acquisition of ICT knowledge and skills to equip them for the digital age.*

KEYWORDS: Online teaching, Opportunities, Challenges, Bhutanese higher education.

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1. Introduction

Due to the pandemic, schools and higher education institutions round the globe were compelled to shift in their mode of teaching and learning from face-to-face to online. Although online teaching using learning management systems (LMS) such as Moodle is not a new practice for academics in the colleges of the Royal University of Bhutan (RUB), a sudden transition to teach a curriculum primarily designed for face-to-face teaching through a full mode online teaching has stirred angst amongst the RUB academics. Amidst the angst and initial distrust in online teaching and assessment of students' work,

majority of the academics have embraced the opportunity to improve their knowledge and skills of using digital technology. Findings from earlier studies report that online education offers new possibilities for communication and interaction as well as challenges and opportunities for higher education programs while interfacing with these new possibilities (Borba & Llinares, 2012; Borba et al., 2016; Keengwe & Kang, 2012).

Despite the shift in online teaching, teaching practices in higher education have remained relatively unchanged (Collis & van Der Wende, 2002). In Bhutan, this sudden change in approach from face-to-face to online has posed challenges

for tutors as they had to adjust their teaching methods to online learning environments. For example, online teaching appears to be rooted in traditional content delivery where technology is merely used for creating convenient access to lecture slides and reading materials rather than developing innovative teaching strategies to facilitate deeper learning (RUB, 2020). Besides, it affects their performance and motivation to learn better, consequently, affecting the quality of online classes owing to student's lack of readiness. Christ (2007) explains that today's students are tech savvy but most are not equipped with the academic skills to do well in online classes.

There has been investigation about online learning in higher education, however, research specified on online teaching and learning in the context of higher education programs is still an emerging trend (Blake, 2013; van Deusen-Scholl, 2015). In Bhutan, research in the area of online teaching and learning is literally non-existent. However, the need for ICT-based education has been reflected in the educational policies with the aim to enhance "*nationally rooted and globally competent citizens through equitable and pervasive use of emerging and relevant technology*" (MoE, 2019, p.1). In addition, the policy also leverages ICT as a key element to make education more relevant and viable (MoE, 2019). Therefore, researches are required to explore the opportunities and challenges of online teaching in the Bhutanese education system. Given the availability of budget and the time constraints to carry out a larger study, this study focused on the opportunities and challenges of online teaching in the Royal University of Bhutan. Specifically, the study's objectives were to:

- examine the influence of RUB academics online teaching knowledge and skills to their online teaching practices;
- explore the common online teaching approaches of RUB academics;
- investigate the relationship between academics and students' perception of online teaching; and
- determine the relationship between the perception and practice of online teaching to gender, educational qualification, age,

teaching experience, subject background, and the college the academics come from.

Main research question

What are the opportunities and challenges of online teaching in the colleges of the Royal University of Bhutan?

Sub-questions

- 1) How does RUB academics' online teaching knowledge and skills influence their practice of online teaching?
- 2) What are some of the most common online teaching approaches adopted for teaching, learning, and assessment by academics of RUB?
- 3) What is the relationship between the academics and students' perception of online teaching?
- 4) Is there a relationship between the perception and practice of online teaching to gender, educational qualification, age, teaching experience, subject background, and the college the academics come from?
- 5) How do RUB academics perceive the opportunities of online teaching in the colleges of RUB?
- 6) What are the challenges of online teaching in the colleges of RUB?

2. Literature

2.1. What is online teaching?

Decades ago, teacher knowledge consisted of two knowledge types: pedagogical and content knowledge (Shulman, 1987). Mishra and Koehler (2006) proposed teachers to include technological knowledge as a third basic component for effectively teaching in the digital era. They called this approach as TPACK and defines teachers' technological knowledge (TK) in addition to content knowledge (CK), pedagogical content knowledge (PCK), and general professional knowledge (GPK) and hence, the TPACK model specifies various intersections of TK with CK, PCK, and GPK.

Since then, technology is used to enhance learning in education sectors to connect the world economically, socially, politically, and culturally. One might see technology-enabled learning as

a continuum starting with face-to-face teaching and ending with online teaching. However, there are wide array of concepts that describe online teaching, including distance education, online teaching, emergency online education, remote teaching (Carrillo & Flores, 2020). Redmond (2015) claims online teaching occurs when the content is available online. Allen and Seaman (2013) describe it as a technology-enhanced or web-facilitated face-to-face teaching and learning. Additionally, refers to it as a blended teaching where online and face-to-face combine to deliver a course. Following the above ideas, online teaching in the context of this study is understood as a technology-enabled teaching, learning and assessment environment.

2.2. Importance of online teaching in higher education

Research on online teaching and blended learning in higher education (HE) has increased considerably (Garrison et al., 2010). Technology has been used to enhance learning in all education sectors and environments (Redmond, 2015). Owing to new era, children are referred as digital natives and learn not from the linear, paper-based data in textbooks but from hyperlinked, random access, digital sources that are available online.

In light of this, Pallo and Pratt (2007) claim that advanced technology allows educational institutions to deliver content in the teaching of undergraduate and postgraduate classes. This was supported in a meta-analysis studies (U.S. Department of Education, 2009); Cavanaugh et al., 2009; Li & Beverly, 2008); Salzman et al., 2006) which found that on average, students in blended courses performed better on standardized tests, researcher-created assessments, and teacher-created assessments. Cavanaugh et al. (2008) additionally point to greater improvement in 21st century skills such as critical thinking, researching, using computers, learning independently, problem solving, creative thinking, decision-making, and time management skills of online students compared to their counterparts in traditional classroom settings. This shows that the application of technology in teaching can transform learning (Reid, 2012). Serrano et al. (2019) also posit that blending of face-to-face, online and self-paced

learning leads to better student experiences and outcomes. Furthermore, Kennedy (2015) states that a Technological Pedagogical Content Knowledge (TPCK) instrument adapted for learning in higher education could contribute to the field, in particular by supporting novice online teachers' self-efficacy and scaffolding their online teaching practices. Similarly, Flavel et al. (2019) note the importance of professional development as it tends to have a positive impact on the participants through increased levels of confidence and perceived ease of use. Such supports need to be extended to both students and teachers as the mere presence of computer technology hardware does not necessarily lead to student progress (Li & Ma, 2010).

2.3. Opportunities of online teaching

Research indicates that online environment benefits more than what the traditional classroom environment offers (Thompson, 2010). Use of multimedia tools remains a significant advantage of conducting online teaching. Further, the diversity and dynamic nature of multimedia could provide opportunities, enhancing the digital pedagogy. Online teaching also allows students to take advanced courses that would otherwise not be accessible to them (Thompson, 2010), like exposing both teachers and students to online teaching learning platforms such as Zoom, Google meets, SoloLearn, Udemy, and many more to widen their academic exposure and understanding (Mishra et al., 2020).

Another study reports that online teaching is flexible and accessible as it provides freedom to do their works (Young, 2006). Jung (2005) declares that teachers benefits by learning technology skills and if they embed technologies in pedagogy, it can provide greater potential for social learning and co-construction of knowledge (Kivunja, 2013). Further, Gillett-Swan (2017) adds that diversity in lecturers' own learning and assessment experiences can provide university students with direct experience which they can use in their future work environments.

Williams and Sekret (2018) also argue that participants of structured online learning benefit from social media by crediting it with networking and knowledge-sharing opportunities. Similarly,

ICT-integrated curricula and interdisciplinary digital pedagogy facilitate collaboration among educators and learners by creating interactive activities (Northrup, 2002). It further provides learners with personalised and active learning experiences (MoE, 2019). Additionally, Lee (2005) reports that students felt that self-directed nature of online activities were helpful for them in improving their organizational skills, self-responsibility and accountability for their own learning.

Further, it promotes intense participation, increased opportunities for learning, flexibility for instructor and student, and increased access (Clark-Ibanez & Scott, 2008). Specifically, Palloff and Pratt (2005) claim that student's participation in an online environment leads to improved learning. More importantly, Singay (2020) asserts that learners can have unlimited access to resources and materials. It also enhances learners' creative thinking and independent learning through online learning. To conclude, the literature indicates that blending teaching with ICT benefits and offers unprecedented accessibility to quality teaching and learning.

2.4. Challenges of online teaching

There are challenges associated with online teaching besides its benefits. Crawford -Ferre and Wiest (2012) claim that many higher education academics commence with little to no training for online instruction. As a result, online instructors face challenges related to designing, facilitating and responding to the diverse needs of students. Relatively, Young (2006) contends that an online instructor must design the course in advance, prepare materials, schedules and etc. Such demands of online teaching make many academics feel apprehensive and not appropriately equipped to teach on a full mode online teaching (Rucker & Downey, 2016; Schmidt et al., 2016; Thorsteinsson & Niculescu, 2013). Additionally, it demands teachers to learn the usages of technologies in their teaching (Robinson & Latchem, 2004) as there is a transition to online teaching. Sekret et al. (2019) further contend that tutors encounter problems regarding instruction like not being able to organise interactivity among the students, conduct online lectures and

assure active learning during online sessions, provide fair and timely evaluation and develop the content and define strategies of its delivery. Other studies also support the difficulties associated with interaction between the learner and the learning environment in online teaching and learning (Enkin & Bikandi, 2015; Thompson, 2010), and lack of scope for meaningful interaction, level of understanding, the range for innovative teaching, mechanical conduct of classes, lack of motivation as immediate feedback was not possible in the online teaching-learning transition phase and unstable network issues (Mishra et al., 2020). Another challenge associated with online education is assessment in an online environment (Boitshwarelo et al., 2017). Prisacari and Danielson (2017) point out exams as a common tool for assessing student learning and assigning grades. More recently, online exams for students are conducted via learning management systems (LMS) or other testing platforms (Prisacari & Danielson 2017). However, such modes have raised both academic and non-academic issues in relation to designing and administering online exams as well as monitoring students' behaviour during the exam. Besides, Attia (2014) and Pagram et al. (2018) claim that online examination environment makes it easier to cheat as there is absence of monitoring (Aisyah et al., 2018).

In Bhutan, status of ICT-integrated pedagogy in higher education is at an early stage and is affected by low-speed internet connectivity and a lack of adequate resources as well as training in ICT-integrated pedagogy (Choeda et al., 2016). In addition, online teaching demands learners to be well organized, self-motivated, and possess a high degree of time management skills to keep up with the pace of the course. Therefore, in order for an online program to be successful, the online course, the instructor, the technology, and the learner are to take advantage of the strengths of this format and avoid pitfalls that could result from its weaknesses (Singay, 2020).

3. Methodology

Based on pragmatist paradigm, convergent mixed methods research design (Creswell &

Creswell, 2018) was employed to investigate the opportunities and challenges of online teaching in the colleges of RUB. A convergent mixed method research design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs methods equally, analyzes the two components independently, and interprets the results together (Creswell & Creswell, 2018; Creswell & Pablo-Clark, 2011).

With interviews and surveys of current tutors and students in the colleges of RUB, this study sought to provide a better understanding of how technology driven education might provide opportunities and challenges to the tutors and students.

3.1. Research context and participants

This study involved the participation of academics and students from the constituent colleges of RUB. RUB was launched on 2nd June 2003 as an autonomous university to provide tertiary education in Bhutan. It has nine constituent colleges and two affiliated private colleges with a total of 9726 students and 553 teaching faculty. ICT has been defined as an indispensable tool for success in all areas of learning in the country, and a strategy for the years 2014–2024 has been developed by Ministry of Education (MoE) to enhance “*nationally rooted and globally competent citizens through equitable and pervasive use of emerging and relevant technology*” (MoE, 2019, p.1). The need for emphasis on ICT has been supported by a study in SCE that indicates that ICT-integrated pedagogy is affected by lack of training and resources (Choeda et al., 2016).

Eleven colleges under RUB were approached to take part in a study on online teaching. A random sampling was used to identify the students and academics to respond to a survey constructed specifically for this study. For the qualitative data, a purposive sampling method was used to identify tutors and students. The targeted population for the survey was 30% of the total population of RUB student and faculty. However, due to pandemic only 1206 students out of 9726 and 153 lecturers out of 553 responded to the survey data. For the interviews,

30 participants were selected to collect an in-depth data and all the participants (both lecturers and students) responded to the email interviews. Ethics are of great concern in research, especially when human subjects are involved (Farrell, 2005; Creswell, 2018). Approval and consent from the participants were sought to conduct the study. Pseudonyms were assigned to protect the identity of the participants.

3.2. Data collection

Survey allows the researcher to collect information from a sample or entire population to describe, compare, relate, or predict their attitudes, opinions, behaviours, characteristics, or knowledge (Creswell, 2018). Two separate online survey, for teachers and students, were constructed to gather quantitative data on the opportunities and challenges of online teaching. The survey consisted of Section A which involved demographic information of the participants and Section B involved items related to online teaching. The survey consisted of five themes with 55 items for lecturer’s survey and 65 items for student’s survey. The themes for lecturer’s survey: 1) Lecturer’s online teaching knowledge and skills (8 items); 2) Lecturer’s level of preparedness and competence (15 items); 3) Lecturer’s online teaching and assessment practices (11 items); 4) Lecturer’s knowledge of taking care of online wellbeing (12 items); and 5) Lecturer’s accessibility to online resources respectively (11 items). Likewise, the themes for student survey: 1) Lecturer’s online teaching knowledge and skills (9 items), 2) Lecturer’s level of preparedness and competence (18 items); 3) Lecturer’s online instructional and assessment practices (15 items); 4) Lecturer’s knowledge of taking care of student’s online wellbeing (16 items); 5) and student’s accessibility to online resources respectively (7 items).

The questionnaire was answered anonymously between January and March 2021. Validity of the survey was warranted by seeking expert appraisal. Pilot testing was conducted to check content and face validity and Cronbach alpha test was executed to check the internal consistency and reliability of the scales (survey instrument).

Konting et al.’s (2009) Cronbach alpha test

was adapted to interpret the reliability of the survey items. The five themes from lecturer’s survey generated from 25 participants showed an acceptable and good reliability, with a Cronbach’s alpha of 0.72, .83, .87, .89, and .84 respectively. Likewise, the five themes from student’s survey conducted with 84 students indicated a value of .94, .96, .92, and .96 while the last theme generated a value of .85, indicating a range of excellent and good. The overall value generated was .97, depicting a range of highly reliable items (See Table 1).

Email interviews were conducted to gather information (Creswell & Creswell, 2018) on online teaching and learning practices of academics and students. The interviews were conducted in English and lasted between 20 to 30 minutes. Interview questions were pilot tested and data were collected in the Fall Semester of 2020. Two structured open-ended interview protocols, one for academics and another for students were developed. Interview data were interpreted simultaneously for analysis. Because the interviews were exploratory, the academics and students were informed to describe various aspects of their online teaching, use of technology, successes and challenges encountered.

With the purpose of corroboration and validation, the researchers triangulated the methods by directly comparing the quantitative survey results and qualitative findings. In the process, two datasets were obtained, analysed separately, and compared (Creswell, 2018).

4. Data analysis

A data visualization of the Likert-scaled response survey questions was produced.

Likert-scale was used to measure the lecturers’ and students’ opportunities and challenges of online teaching. Data were analysed following each predetermined theme and pattern by carefully examining the results of the lecturers’ and students’ Likert-scaled responses. Finally, the data was tallied and the results for each theme was calculated using SPSS to examine the descriptive analysis and inferential statistics.

Data from the interview was analyzed and interpreted using a thematic approach (Creswell, 2007). The transcribed data were rechecked. The interview data and open-ended survey responses were analysed purposively to help interpret the analysed survey data.

5. Findings and discussion

This section presents the results of the quantitative and qualitative data. The results of the survey and the interviews are merged and discussed under each of the five different themes. Besides, the findings are also discussed in light of literature.

Theme 1. Lecturers online teaching knowledge and skills

As shown in Table 1 and 2, the average mean for theme 1: lecturers’ online teaching knowledge and skills is 4.33 and 4.25 which is near to Somewhat Agree category. This shows that lecturers are somewhat satisfied with their online teaching knowledge and skills and students are somewhat content with online learning and lecturers’ online teaching knowledge and skills. Such situation could be attributed to lecturers’ personal interest and initiative taken by the colleges in offering professional development courses. This finding aligns with research that

Table 1. Descriptive analysis of online knowledge and skills (Lecturers’ survey)

Predetermined Themes	N	Mean	Std. Deviation
Lecturer’s online teaching knowledge and skills	153	4.33	.99
Level of preparedness and competence	153	4.37	.81
Lecturer’s online instructional and assessment practices	153	4.39	.75
Lecturer’s knowledge of taking care of online wellbeing	153	4.39	.75
Lecturer’s accessibility to online resources	153	4.71	.85
Valid N (listwise)	153		

Table 2. Descriptive analysis of online teaching knowledge and skills (Students' survey)

Predetermined themes	N	Mean	Std. Deviation
Lecturers' online teaching knowledge and skills	1206	4.26	.88
Lecturers' level of preparedness and competence	1206	4.29	.87
Lecturers' practice of online instruction and assessment	1206	4.29	.84
Lecturers' management of students' wellbeing	1206	4.38	.72
Students' access to online resources	1206	4.23	.91
Valid N (listwise)	1206		

Table 3. Independent sample t-test of lecturers' online teaching with gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Lecturers' knowledge and skills for online teaching	Equal variances assumed	1.696	.195	-.542	151	.589	-.09120	.16823	-.42359	.24119
	Equal variances not assumed			-.598	75.978	.552	-.09120	.15263	-.39518	.21278

emphasises the importance of Technological Pedagogical Content Knowledge (TPCK) instrument adapted for learning in higher education (Kennedy, 2015) which plays a role by supporting novice online teachers' self-efficacy and scaffolding their online teaching practices.

Likewise, the independent t-test was conducted between lecturers' and students' knowledge and skills to gender (See Table 3 and 4). The value of 2 tailed significance (p) is higher than 0.05. This indicates that there is insignificant difference between lecturers' and students' online teaching knowledge and skills to gender, indicating that there are no differences in the skills and knowledge possessed by both male and female lecturers and students of RUB colleges.

This finding was supported by qualitative data which indicates that this was the result of a good mix of academic exposure and experience provided by online teaching including exposure to ICT trainings. As a result, lecturers (n=77) reported that they learned to use VLE and various education technology in planning, delivering and assessment

of modules. This included planning for teaching, learning and assessment (TLA) and aligning TLA with pedagogical approaches that fitted the need of online mode. An inclusion of technological knowledge is must for teaching effectively in the digital era (Mishra & Koehler, 2006).

“Online teaching has given us more flexibility, use of more videos and other education technology while teaching. It has helped us to use and adapt social media apps for formal teaching and learning as a second-tier of the official VLE platform.” (L1, L2)

“My experiences, therefore, are diverse with positivity predominating the more or less few challenges like net connectivity, etc.” (L4)

Research findings of Mishra et al. (2020) report that both teachers and students being exposed to multiple online teaching learning platforms to widen their academic exposure and understanding which supports our findings that for smooth transition of teaching learning, exposure to multiple and effective ICT tools are

Table 4. Independent sample t-test of students' online teaching with gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Overall, I am happy and satisfied with online learning.	Equal variances assumed	.086	.769	2.561	1202	.011	.213	.083	.050	.376
	Equal variances not assumed			2.566	1199.307	.010	.213	.083	.050	.376

necessary and needed. For instance, lecturers reported that they were exposed to online platforms like Camtasia, YouTube, and Padlet and they found them very effective (n-30) as these tools facilitated and increased participation and concentration from the students. In addition, some lecturers (n-7) stated that they created their own YouTube Vlog whereby they uploaded their offline recorded lectures and used Camtasia and H5P features to produce video lectures and create quizzes. Following the Vlog, students uploaded tasks through their own personal blogs. Similarly, most lecturers admitted to using PPTs with voiceovers for delivery of lessons, video conferencing and Google Meet (n-99). Some lecturers (n-5) also confirmed that they made PPT by creating 10 minutes videos with planned interactions in between. However, it was found tedious as planning of such lessons consumed a lot of time. These three tools, according to the lecturers benefitted students as they were accessible online. In conclusion, the online tools were efficient (than zoom lessons). Such findings have also been supported by (Gillett-Swan, 2017).

"I found google meet to be the most effective, since I can see the faces of my students and can gauge their attentiveness. Using this platform, I can record the lectures and immediately mail to my students for their use." (L4)

Besides, being exposed to diverse apps like Moodle, lecturers (n-120) and students (N-777) also felt that online learning permitted them to

multitask. The interview data reports that they (L=13, S-17) were able to create their own YouTube Vlog to upload their recorded lectures.

"Making posters, recording video presentations and using softwares that I didn't even know existed are some major things that I learnt during this online learning." (S1)

The creation of Vlog allowed students to upload tasks through their own personal blogs.

Similarly, students (n=17) said that they learned to produce their own presentation materials using recording apps. This is in line with Meyer (2010) who stated that online students learn as much as their traditional classmates.

"I have learnt and gained enough knowledge and skills form online learning such as making and recording power-point presentations and presenting it to the class on zoom-meets, and many other skills." (S3)

Such findings specify that use of technology can transform teaching learning processes. This finding is consistent with Cavanaugh et al. (2008).

This finding also mirrors the priority given by colleges in providing access to professional development courses within and outside of the colleges. These findings support Flavel et al.'s (2019) findings which reported the impact of professional development on the participants.

Besides the learning opportunities, lecturers felt that they were bombarded to learn many technological apps that served the same purpose.

Thus, a need to focus on learning a few tools competently was suggested.

“I think we need to care that our lecturers know how to use at least one or two tools proficiently, and that the use of those tools adequately covers all necessary student learning experience. Focusing on the number and diversity of tools we use feels like time not well spent to me.” (L11)

5.1. Lecturer’s level of preparedness and competence

The average mean for theme 2: Lecturers’ level of preparedness and competence is 4.37 and 4.29 which falls under Somewhat Agree category (Table 1 and 2). This shows that lecturers and students are somewhat satisfied with lecturers’ level of preparedness and competence for online teaching, indicating that more support needs to be rendered to improve lecturers’ level of preparedness and competence for online teaching to meet students’ learning needs. These findings correspond with research that emphasises the importance of teacher competence in successfully attaining to relevant educational goals (Kaiser & Konig, 2019).

Likewise, when lecturers’ level of online teaching preparedness and competence to

qualification was compared, the analysis table shows that there is a statistically insignificant relationship ($p=0.007$) between lecturers’ level of online teaching preparedness and competence to their qualification (see Table 5 and 6). Not statistically significant ANOVA result shows that there are differences in the level of preparedness and competence for online teaching across RUB lecturers. This was further supported by the mean value for lecturers with PgCHE and PgDHE which was higher (4.63 and 4.79 respectively), indicating that they possess sound online teaching knowledge and skills. This could be because they attended a module on education technology as part of their PgCHE and PgDHE courses.

Similarly, as per the one-way ANOVA analysis, the relationship between lecturers’ online teaching competence and preparedness to their years of experience is statistically significant ($p-.001$), showing that the lecturers teaching at different college have differences in the online teaching knowledge and skills that they possess (see Table 7 and 8). This was further supported by the high mean value of lecturers with the experience of 1-5 years (4.73), showing that they have better online teaching knowledge and skills compared to other age groups.

Table 5. Lecturers’ level of online preparedness and competence to qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.550	5	2.510	3.362	.007
Within Groups	109.749	147	.747		
Total	122.30	152			

Table 6. Lecturers’ level of online preparedness and competence to qualification

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
B.Ed	11	4.15	.75	.23654	3.6134	4.6675	2.09	5.36
PGDE	12	4.05	.74	.21217	3.5785	4.5124	2.82	5.00
PGCE	43	4.16	.96	.14637	3.8568	4.4476	1.64	5.91
PGCHE	61	4.63	.78	.09935	4.4287	4.8262	2.73	6.00
PGDHE	6	4.79	1.11	.45130	3.6278	5.9480	3.36	6.00
M.Ed	20	3.94	.94	.20979	3.4927	4.3709	1.73	5.09
Total	153	4.33	.89	.07252	4.1853	4.4719	1.64	6.00

Table 7. Lecturers' online teaching competence and preparedness to experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	14.05	4	3.52	4.81	.001
Within Groups	108.26	148	.731		
Total	122.30	152			

Table 8. Lecturers' online teaching competence and preparedness to experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1-5 years	42	4.73	.69	.10504	4.5173	4.9416	3.55	6.00
6-10 years	21	4.33	.83	.17971	3.9455	4.6952	2.09	5.27
11-15 years	50	4.31	.97	.13615	4.0318	4.5791	1.73	6.00
16-20 years	32	3.86	.86	.15091	3.5445	4.1601	1.64	5.36
21-25 years	8	4.29	1.05	.37037	3.4197	5.1712	2.27	5.82
Total	153	4.33	.89	.07252	4.1853	4.4719	1.64	6.00
Total	153	4.3286	.89700	.07252	4.1853	4.4719	1.64	6.00

It appeared that they were able to grasp ICT knowledge faster than the other age groups owing to their age and interest. Thus, they tended to possess better ICT knowledge and skills compared to lecturers with other teaching qualifications.

The statistical significant difference existed between and within the groups with p value .001 (see Table 7). Therefore, post hoc test was conducted to determine the existence of significant differences within or between groups. The result indicated that a significant differences exists between 1-5 years and 16-20 years with the p value=.05, showing that 1-5 years have better online competence and preparedness than 16-20 years (see Table 9).

Despite differences in the level of preparedness and competence for online teaching, knowledge, qualification and experience, the qualitative data collected from the students indicate the need for all lecturers and colleges to come up with new initiatives including teaching, learning and assessment strategies that would produce positive results. Likewise, lectures also felt that more practical and appropriate strategies that align with the topics should be included as Northrup (2002) asserts that ICT-integrated curricula and

interdisciplinary digital pedagogy facilitates collaboration among educators and learners with planned activities to have a greater learning and motivation.

Such findings corroborate the findings of Flavel et al. (2019) that relevant professional development that will enable faculty to design student-oriented courses should be provided. As of now, lecturers and students asserted that module plans and assessment are not online oriented.

“Module semester-plan, assessment components and exams were not planned for online, and we had to run those as a trial and error method.” (L1)

5.2. Lecturer's practice of online instruction and assessment

As shown in Table 1 and 2, the theme lecturers' online instructional and assessment practices have an average mean of (M=4.39 and 4.29 respectively), indicating that lecturers and students were somewhat satisfied with lecturer's knowledge and skills pertaining to management of online instructional and assessment practices.

Correspondingly, the qualitative results reveal that online learning environment has

Table 9. Multiple comparisons Post Hoh test between lecturers' online teaching competence and preparedness to teaching experience

Dependent Variable: Online preparedness

Tukey HSD

(I) Years of teaching experience:	(J) Years of teaching experience:	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1-5 years	6-10 years	.32698	.20917	.523	-.2507	.9047
	11-15 years	.34565	.16381	.221	-.1068	.7981
	16-20 years	.60407*	.18365	.011	.0969	1.1112
	21-25 years	.17698	.30191	.977	-.6568	1.0108
6-10 years	1-5 years	-.32698	.20917	.523	-.9047	.2507
	11-15 years	.01867	.20352	1.000	-.5434	.5807
	16-20 years	.27708	.21980	.716	-.3299	.8841
	21-25 years	-.15000	.32517	.991	-1.0480	.7480
11-15 years	1-5 years	-.34565	.16381	.221	-.7981	.1068
	6-10 years	-.01867	.20352	1.000	-.5807	.5434
	16-20 years	.25842	.17718	.591	-.2309	.7477
	21-25 years	-.16867	.29802	.980	-.9917	.6544
16-20 years	1-5 years	-.60407*	.18365	.011	-1.1112	-.0969
	6-10 years	-.27708	.21980	.716	-.8841	.3299
	11-15 years	-.25842	.17718	.591	-.7477	.2309
	21-25 years	-.42708	.30937	.641	-1.2815	.4273
21-25 years	1-5 years	-.17698	.30191	.977	-1.0108	.6568
	6-10 years	.15000	.32517	.991	-.7480	1.0480
	11-15 years	.16867	.29802	.980	-.6544	.9917
	16-20 years	.42708	.30937	.641	-.4273	1.2815

*. The mean difference is significant at the 0.05 level.

facilities for conducting assessment. Generally, the lecturers (n=23) reported using online quizzes, assignments and video presentations as assessment tools. Specifically, lecturers used peer assessment to check students' learning progress on some learning tasks especially group work. Additionally, lecturers indicated that these tasks stimulated student to provide feedback about each other's work. Besides, students were made to submit evidences of their interactive session and assignment report. Such findings indicates that the lecturers were aware of student's behaviour during online session which helped in designing online courses.

"I also made the students provide feedback and

comments on each other's work on (I grouped or paired them for this task), the discussion forum entries for different sessions and for journal entries too. It worked quite well." (L7)

"To facilitate interaction among students, I use to provide group work where they are assessed in group as well as individually for the same assignments. Groups have to also submit the evidence of their interactions and individual reflection apart from their assignment report." (L8)

Besides, lecturers reported creating zoom split rooms for group discussions and breaking up synchronous discussions. Hence, such tools were used for reviewing or completing formative

assessment tasks. Additionally, Apps like Slido and Google Suite were used for group work. Such apps, according to the lecturers were useful for making students discuss and work collaboratively.

“Zoom breakout rooms – these worked amazing for creating small group discussions and breaking up larger synchronous discussions. Implementing either at the beginning of a lesson so students could collaboratively review, or at the end of the lesson so students could collaboratively complete a formative assessment task and then share out with the group.” (L5, L12)

Additionally, a few lecturers stated that they designed follow up activity for each session to assess students' understanding and progress on the lesson. However, they faced difficulty in assessing and providing feedback to these follow up activities due to time constraint and class strength.

Lecturers (n-30 [interview], n-79 [survey responses]) also reported that they used WhatsApp, WeChat, Messenger, Telegram, and e-mail for communication and correspondences. Particularly, for addressing individual and whole class needs, clarifying their doubts and also for relaying information. For instance, L9 said, *“I use Facebook messenger and WhatsApp for class group and discussions and updates.”*

Lecturers reported assigning marks for class participation to facilitate interaction as said by L10, *“Keeping marks for participation also encourages them to participate in the class.”*

Although lecturers appreciated the instructional and assessment techniques provided by an online environment, online instruction and assessment particularly in RUB colleges was seen as a challenge.

Generally, the lecturers and students were positive about online teaching learning, lecturers (n-13) and students (n-41) expressed that modules that required practical, fieldwork, lab work and experiential learning were difficult to achieve. For example, L3 said, *“In teaching the nursing students it is even more challenging given the complexities involved in teaching like getting the practical lessons across to the students.”* Hence, lecturers overlooked the practical experimentations while teaching and

focused solely on theoretical lessons. As a result, students were not able to practice.

Similarly, students also supported that learning of some topics were challenging, especially topics and activities that require hands-on laboratory-based learning experiences. For example, S1 said, *“practical, and experiments that require instruments and environment cannot take place promoting only theories without any practical applications.”*

In conclusion, learning activities that required hands-on and F2F contacts were compromised.

“One of the major challenges was teaching difficult concepts online, as our programme as a whole is designed for face-face teaching and learning.” (L1)

“When there is no input from the tutor on such an abstract concept, there is no learning, students are led by misconceptions, lose interest in learning the STEM subjects.” (S16)

Moreover, getting accustomed to online learning like group assignments was another challenge that students have faced as noted by S11, *“Group tasks and assignments were quite challenging as some of the members simply rely on one member who is quite good at academics which was limited by online learning.”*

Besides instructional challenges, lecturers also experienced challenges related to assessment. This according to the lecturers (n-17) was due to lack of preparation, and academic dishonesty that seem to be rampant among the students. Moreover, students' commitment to submit timely and quality assessments was another setback that the lecturers have experienced in an online mode. For example, L13 said, *“I feel assessment during online was hectic. For example, they don't submit assignments on time and if we conduct an exam, they can share answers amongst themselves and can score more though they have less in learning.”*

Lecturers suggested that the conduct of exams through online needs to be thoroughly discussed and proposed to include more open questions in order to minimise malpractices.

“Even assessments of examination answer sheets are a big challenge since students do not write answers on their own rather are resorting to copy paste strategy.” (L2)

“Students are really lucky to score good marks through online teaching because of insincere conduct as all the examination answers were getting from google and other sources of media.” (S4, S13, S14)

Additionally, lecturers (n-10) asserted that VLE server posed problems while conducting examinations whereby many students experienced difficulty in uploading their answer scripts. In such circumstances, formative assessments, including online quizzes, may have been possible, to curb such issues. Nonetheless, the question arises as to why many lecturers did not apply such approaches. This corroborates findings by Konig et al. (2020), who report similar issues. Hence, it is possible that only a few lecturers have knowledge about online assessment.

Lecturers were also found conducting open book examination. In regard to this, Mohanna et al. (2015) assert open book open web (OBOW) exams as an effective method for assessing student’s ability to understand the subject and reproduce it and while Vanderburgh (2005) asserts it as beneficial and useful for enhancing critical thinking. However, this study reports open book exams to be ineffective leading to academic dishonesty. This could be because lecturers are insufficiently trained or experienced in open-book test construction (Vanderburgh, 2005). Aligning to this, lecturers (n-15) suggested that such exams should be conducted in an organized exam centers with proper invigilation.

“Exams should be conducted in the organized exam centers with proper invigilation. Unless we have a module that measures learning in a completely different way, for example, by way of construction of a model, prototype etc.” (L6)

Lecturers (n-20) also expressed that besides examinations, they also experienced challenges while assessing students’ learning in an online teaching as it robs them of monitoring students’ performance. For example, L16 said, *“we really don’t know who is doing well and who isn’t.”* This might be indicative of lecturers needing more practice in online assessment in order to give a more accurate picture of students’ performance. Aligning to this, Uribe and Baughan (2017) highlight the importance of the formative component of the learning experience and

specifically, puts a focus on feedback as a vehicle for learning, and Thurlings et al. (2014) further stress the need for lecturers to provide timely, constructive, specific and detailed feedback at different stages of the learning process as teacher’s facilitation in an online environment.

Lecturers added that class test or group work seems to promote unhealthy practices. For example, they revealed that during the test, students were caught discussing and copying from each other with the intention to get marks. According to them, this may contribute to getting higher scores but not learning. The forcible problem could be that the assessment practices that the lecturers have followed for online teaching could be those that were designed for face-to-face teaching. Thus, a misalignment of teaching and assessment. In such environment, research has suggested to use formative assessments, such as online quizzes (Konig et al., 2020).

“Even when doing class tests, students would sit in groups and discuss, and copy from friends. Hence, I would say distant learning is not a good way to assess students’ understanding. This method may help students who want marks but will definitely not help who would want to learn.” (L17)

Lecturers also pointed out that a software called URKUND plagiarism has been integrated with VLE to check the authenticity to assess students work. However, they opined that the plagiarism software was not used effectively and therefore, assessing students’ work was challenge. This finding shows that lecturers lacked application knowledge pertaining to the software. Hence, an orientation on the use of URKUND needs to be administered by the respective colleges for effective usage.

“We really don’t know how authentic their submissions are even if they are made to submit through some kind of software that detects plagiarism and measures originality. We received quite a number of submissions that had been interpolated with some hidden characters to evade the software. Hence, after due consideration, I still prefer face-to-face teaching to online teaching.” (L16)

Furthermore, both the lecturers and students contended that activities that require timely and

constructive feedback could only occur if class sizes were reduced. Such technique according to the lecturers and students can bring out better result. This finding is in line with Sekret et al. (2019), who assert that tutors encounter problems pertaining to assessment like fair and timely evaluation in an online environment.

5.3. Lecturers' management of students' online well-being

As shown in Table 1 and 2, the average mean for the theme 4: Lecturer's management of students' online well-being inclined slightly towards Somewhat Agree category (4.39 and 4.38). This indicates that lecturers were somewhat sure about managing students' online well-being and students were somewhat happy with lecturers' management of their well-being.

The interview data suggested a similar finding wherein teaching learning ambience, lecturers and students both emphasized the importance of facilitating healthy teaching learning ambience as incorporating flexibility allows discussions to evolve and build relationships (Gillett-Swan, 2017). For instance, both lecturers and students promoted independent and competency-based learning, self-regulated and self-paced learning and made the students to understand syllabus by allowing them to take ownership of their own learning.

Young (2006) reports that online teaching is flexible and accessible and at the same time it offers freedom to do their work when and where they want. Supporting Young (2006), specifically, the interview (n-30 [lecturer and student]) and open-ended responses (n-111 [lecturers], n-756 [student]) indicated that online teaching offers flexi timing and enhances self-paced learning while students informed that online learning has no time and place barriers. Tutors can teach and students can learn following their own pace, convenience and comfort zones. In this way, both lecturers and students felt that online teaching promoted room for effective learning.

"One can simply snuggle under the blanket and join lectures peacefully and learn. This is the comfort of e-learning." (S4)

"More convenient and efficient in delivering

the module since the online classes can be conducted from any part of the world. This also adds to the time required for the tutor to conduct research and other non-teaching activities on campus and beyond campus." (L6)

Furthermore, lecturers and students reported that the virtual learning environment (VLE) has varied features that facilitate interaction with learners. Lecturers expressed that they use social media platforms including WeChat and Google classroom to enable interaction.

"Telegram – worked perfect for sending updates to students. I used this as the main form of communication for classes. Not content delivery, just coordination, updates, and reminders." (L5)

Moreover, class blogs on VLE, Jamboard and Padlet aided students to post questions, share work and have discussion on the topics by promoting effective learning ambience.

"Besides VLE, I and my class also used social media such as class wechat, WhatsApp, and google class whenever needed. We also used a class blog on VLE to enable students to post questions and have discussion on the topics." (L6)

However, lecturers expressed their challenges in managing students' online well-being. In line, Sekret et al. (2019) argue that tutors encounter problems pertaining to instruction such as not being able to organise interactivity among the students, assure active learning, facilitate students' active participation during online sessions. Other studies also support the difficulties associated with interaction between the learner and the learning environment in online teaching and learning (Enkin & Bikandi, 2015; Thompson, 2010). Such findings also emerged in our study whereby the interview (n-19 [lecturers], n-24 [students]) and open-ended survey data (n-87 [lecturers], n-105 [students]) implied that online teaching learning process was purely mechanical devoid of human connection and lack student energy that prevail in a classroom due to physical presence of students. For example, L19 said, *"There is lack of human touch in online teaching."* As a result, lecturers felt that such a setting made students feel isolated and lonely as it prevented socialization and working together with peers. Further, it intensified anxiety and stress amongst students as they had to complete

all the academic activities and assignments by themselves.

Another drawback of online teaching learning is lack of student’s attention due to virtual setting. This means that lecturers need to be aware of learner’s need and organize activities that would facilitate students’ participation and interaction. On this, research suggests the shift of responsibility on the students to drive their own learning with the lecturers as a facilitator (Chigeza & Halbert, 2014). Besides, some research also recommends providing students with the opportunity to perform as discussion moderators (Phirangee, 2016), to enhance their active role in the online process and making them co-responsible of both their own and peers’ learning. Moreover, in an online mode, lecturers faced difficulty to build classroom culture and community including setting group norms, offering times for reflection and accountability, establishing structure in asynchronous communication. For instance, L5 stated, *“Building classroom culture and community is tough and there is greater difficulty because I know “how” to do it, but I felt like I could never accomplish it.”* Such findings denote that lecturers lacked knowledge and skills to create conducive online learning environment. Hence, lecturers need to explore measures and strategies that would address these issues. For instance, as intimated by Zayapragassarazan (2020), lecturers can emphasize on flexible learning which provide students with a variety of learning choices to make learning outcome useful and exciting.

Students also asserted that the level of satisfaction they receive from online teaching learning is minimum as negligence from tutor’s instigated self-study, lack of human touch, and practical work. Interestingly, where students thought lecturers did not take enough responsibility for them, lecturers felt some students did not take learning seriously. For

example, L6 said, *“Casual students can go so haywire that they are the worst affected group since they cannot cope with the tempo of the online class.”* This is because there are no proper mechanisms placed to monitor online teaching posing difficulty for lecturers to check students’ attendance. However, with right teaching learning strategies, both lecturers and students can teach and learn effectively.

Likewise, according to the one-way ANOVA, there is a statistically significant difference between the age groups ($F(6, 1199) = 2.920, p = .008$) (see Table 10 and 11). It seems that the younger generations are dissatisfied with the online learning as they preferred face-to-face classroom teaching. But the elder groups were comfortable with online learning.

The qualitative data indicates that lecturers and students found online teaching learning challenging than the face-to-face. Hence, considering these challenges, irrespective of ages, both the lecturers and students report their preference for face to face mode (F2F) over online teaching learning. This according to the students is that F2F promoted an educative atmosphere including self-discipline and regular class attendance unlike online learning. Wherein F2F mode promoted frequent interactions with the tutors, and diversity in learning as students get to listen to diverse views, ideas and more insights from the tutors and friends making learning more enriching and stimulating.

“Being physically and formally present in a classroom brings an educative atmosphere which plays a big part when learning something new. It is very difficult to concentrate along with so many distractions around.” (S4)

Thus, students preferred F2F environment as they felt human connection and interaction was necessary for establishing peer support and in developing in-depth group discussion. Lecturers also shared that F2F teaching allowed them to

Table 10. One-way ANOVA (Students; age to their overall happiness and satisfaction to online teaching)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36.343	6	6.057	2.920	.008
Within Groups	2487.164	1199	2.074		
Total	2523.507	1205			

Table 11. One-way ANOVA (students age to their overall happiness and satisfaction)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
15-20 years	330	3.78	1.59	.082	3.61	3.94	1	6
21-25 years	719	3.82	1.45	.054	3.71	3.92	1	6
26-30 years	70	4.13	1.29	.155	3.82	4.44	1	6
31-35 years	50	4.24	1.44	.203	3.83	4.65	1	6
36-40 years	30	4.53	1.19	.218	4.09	4.98	2	6
41-45 years	6	4.83	.41	.167	4.40	5.26	4	5
46 and above	1	5.00	5	5
Total	1206	3.87	1.45	.042	3.78	3.95	1	6

study the potential of the students individually and design classes accordingly.

“As a business student, I prefer to have a face to face learning because we have to solve many business problems.” (S15)

Students also indicated that f2f mode develops rapport among tutors and students and strengthens interpersonal relationships while online mode deprives them of the motivation to learn and excel as it doesn’t promote real time interaction as said by S8, *“Face to face mode develops rapport among tutors and students and strengthens interpersonal relationships.”*

However, lecturers reported their preference for blended learning as they felt both the learning modes are required for learning certain concepts and skills.

“I prefer blended learning. I feel that blended learning will help me rethink my teaching, help me to think of the limitations of classroom teaching, adapt, adjust and renew my approach to teaching.” (L7)

While students asserted about gaining experiences to adapt to both the learning modes, both lecturers and students looked forward to having F2F teaching and learning. However, considering the teaching for technological age and the need for ICT-based education clearly reflected in the educational policies (MoE, 2019), a blended approach to teaching should be in place as Serrano et al. (2019) claim that blending significant elements of the learning environment such as face-to-face, online and self-

paced learning lead to better student experiences, outcomes and more efficient teaching.

5.4. Accessibility to online resources

As per the Descriptive analysis, the Mean score was 4.71, which inclines towards Agree category (See Table 1). This theme relatively outscores above four themes. The score suggests that the lecturers have access to resources to conduct online classes.

Similarly, qualitative findings disclosed that access to resources and materials both online and hardbound to carry out online classes was available. One of the lecturers highlighted that internet as the medium to share resources is feasible for both lecturers and students. The lecturer summed up by saying:

“As Internet is in itself a ubiquitous platform, online classes were too. The students could access the reading materials for the classes at their comfort as well as it let me upload additional materials whenever I got newer resources.” (L17)

Tutors accessibility to softwares and websites helped students to practice while self-learning.

Use of online learning resources had consequences owing to abrupt interruption. Unprepared and overwhelmed, tutors could not prepare learning materials and resources which are online learning friendly leading to confusion among the learners as argued in the following excerpt:

“Online materials have been really different in terms of its design and delivery. Whereas

face-face teaching and materials are designed in simple and straight forward manner. I think, I prefer face-face teaching and learning given the preparedness question for online in terms of our programme itself. The major reason being students going through number of issues. They are dumped with resources and not able to afford internet cost, and finally students go through stress to cope with the learning and following the assignment due-dates.” (L5)

As shown in the Table 2, the average rating for theme 5 (M=4.23): Accessibility to online resources fall towards Somewhat Agree category. This depicts that the students are somewhat satisfied, indicating that there is a need for the colleges to provide more access to online resources.

Although lecturers were happy with online resources, students (n-217) expressed that online learning consumes a hefty amount of data especially for video conferencing and uploading and downloading lecture videos and materials. Besides, students reported that those with unstable financial backgrounds are at stake. Although students were provided with a reasonable allowance for online learning, these allowances were not invested in productive activities but were used in other unhealthy practices such as playing online games and social media accounts.

Furthermore, students reported that lecturers used textbooks making teaching more textbook oriented and limiting learning. Hence, a few students felt that learning occurred within the culture of passivity. In such circumstances, students (n-48) demanded lecturers to make their teaching effective, creative and diverse. For example, students specifically (S6) suggested methods such as uploading reading materials, assigning learning tasks with time limit, and organizing live presentations through Zoom and WhatsApp.

To this, lecturers expressed that besides uploading learning materials, they also share YouTube educational videos and Mount Royal University (MRU) tutorials to support teaching and learning. Infusion of such learning modes is necessary as students learn with the assistance of online cameras, simulations, blogs etc. (Kivunja, 2014). Besides, such shared resources allow students to revise the topics whenever they

need as stated by L6, “*When I share recorded teaching video clips for each lesson, students get the opportunity to use that to revise the topics whenever they need.*”

Similarly, students pointed out connectivity issues and audio-visual problems. This, however, depends upon many factors such as network coverage, devices used as aligned with Mishra et al.’s (2020) findings. Nonetheless, students (n-17 [interview], n-154 [survey]) perceived these as the major issues which disrupted their motivation and learning. Besides, sudden switch to online mode, lack of accessibility to resources and references were a challenge as students were unable to identify authentic resources.

6. Conclusion, limitation and recommendation

This study focused on studying the opportunities and challenges of online teaching across RUB colleges. The quantitative finding revealed age, experiences, educational qualification and colleges as important predictors of efficacy in the online teaching learning and assessment practices. Further, a positive correlation between lecturers’ online teaching knowledge and skills to online assessment, learning support and resources was noted. However, students’ accessibility to online learning platforms and materials had lower correlation with other items.

Analysis of interviews indicated that lecturers and students point out similar opportunities and challenges for online teaching. The benefits included learning new tools and apps like Camtasia, zoom and etc. Challenges included issues related not only to technological aspects but also issues related to pedagogical approaches. Such issues included connectivity issues that disrupted learning, lack of ensuring social and emotional side of learning including both interaction and engagement, assessing and monitoring online tasks effectively, and difficulty in learning contents that required hands-on. These issues highlight the importance of having sound technological, pedagogical and assessment skills and competences to teach effectively in an online environment.

Our findings will help practitioners to help

re-design courses suited for online mode to manage social and emotional side of learning and assessment. Additionally, it is emphasised that teacher educators need to learn ICT skills to prepare pre-service teachers' competences to realize the directives of the Royal Kasha and national goals related to the integration of ICT in education. Thus, we recommend respective colleges to support lecturers in their acquisition of ICT knowledge and skills to equip them for the digital age. Additionally, RUB may determine strategic interventions in the area of resources support and capacity development of RUB academics in the use of ICT to complement everyday teaching and learning practices.

Despite findings of our study, limitations

are discussed as well. First, generalizability of results is limited due to limited responses to survey. Second, this study was carried out in Bhutan, therefore, generalisation of results to other countries and their educational contexts is hardly possible.

Finally, an in-depth research and scholarly exercises in the area of online teaching and the use of digital technology in teaching, learning, and assessment across all levels of education in Bhutan is recommended

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Appendix

Table 1: The Alpha Cronbach Value of lecturer's and student's survey

Alpha Cronbach Value	Interpretation
0.91-1.00	Excellent
0.81-0.90	Good
0.71-0.80	Good and Acceptable
0.61-0.70	Acceptable
0.01-0.60	Non-acceptable

Note. Adapted from Konting et al., 2009