

## **Online assessments in Maldivian higher education institutions: Challenges faced by students**

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The spread of Covid-19 forced many higher education institutions to switch to e-learning using a diverse range of educational platforms. The purpose of this qualitative research is to explore the challenges encountered by Maldivian higher education institutions conducting online assessment during the Covid-19 pandemic, from both lecturer and student perspectives. Semi-structured interviews were used to collect data from a purposively selected sample of full-time lecturers (n=30) and students (n=30) at 10 different higher education institutions in Maldives. Data were analysed using a thematic analysis. Findings revealed that issues related to technical difficulties, Internet connections, and students' lack of basic technological skills as major difficulties faced by students. Inadequate exam space during online assessment was a root cause of other obstacles. In addition issues related to feedback mechanisms, exam stress and anxiety were also revealed. The study concludes with key implications for effective online assessment.

### **Introduction**

The use of information and communications technologies (ICT) has expanded in every discipline including the higher education sector. The digital transformation observed over the recent decades has revolutionised the way programs are offered and delivered in higher education institutions (HEIs) across the globe. Modern digital tools have provided new opportunities and approaches to teaching, learning and assessment, thus changing the fabric of higher education (Kaputa, Loučanová & Tejerina-Gaite, 2022). It paved the way for teaching and learning to be continued amidst the Covid-19 pandemic. Although a variety of digital tools have been in use in higher education program delivery over the recent decades, the adoption of fully online mode of program delivery was compelled by the unexpected outbreak of the Covid-19 pandemic in most HEIs, especially in the developing countries like Maldives. This rushed and rather unplanned shift from the traditional mode to fully online mode posed several challenges for students, educators and HEIs across the globe. One of the main challenges that HEIs faced was how to assess learners' performance in this novel online context (Akimov & Malin, 2020; Sharadgah & Sa'di, 2020). Hence, online assessments have gained momentum recently and increasing attention has been drawn to explore the impact of it in the higher education sector.

In higher education contexts, several studies have focused on exploring online assessment practices and its effectiveness (Gikandi, Morrow & Davis, 2011), especially in relation to academic integrity, reliability, and validity. A number of studies have also explored

instructors' experiences with online assessments (Al-Magqbal & Hussain, 2022; Cutri, Mena & Whiting, 2020; Joshi, Vinay & Bhaskar, 2021). However, few studies explored the associated difficulties or challenges experienced by students themselves when attending online assessments. Understanding how online assessments affect students' learning outcomes, motivation and engagement is equally important for improving the quality and effectiveness of online education. A thorough understanding of the challenges experienced by students can help uncover the barriers they may face, identify ways to address them to prevent future deleterious challenges, and to ensure the effective execution of online assessments. In addition, since online assessment is also a context-specific and culturally sensitive issues (as different educational systems and cultures may have different norms, expectations, and preferences for assessment), exploring how online assessment works in Maldivian higher education institutions can provide valuable insights and lessons for other similar contexts or regions that face similar challenges or opportunities.

Hence, the purpose of this study is to explore the challenges faced by students in the use of online assessments in Maldives, a geographically dispersed small island nation where online learning and online assessment is generally a novel approach, forced into use due to Covid-19. It is anticipated that the insights from this study will be useful for other HEIs, especially institutes in developing countries, as online learning is here to stay, and it will continue to grow.

## **Literature review**

### **Online assessment**

Regardless of the mode of program delivery, assessment of learning is a vital component of the educational process. It serves to attain three specific outcomes: (1) support learning; (2) execute accountability; and (3) grant certification, progress and transfer (Archer, 2017; Capsim, 2020). It is a process that enables educators to gauge the level of knowledge students have gained by providing evidence on examining if effective and meaningful teaching and learning has taken place (Bhebhe & Maphosa, 2020). Hence, the types of assessment employed must be well aligned with the intended learning outcomes (Akimov & Malin, 2020), regardless of the type of assessment used: formative or summative assessments or whether online or face-to-face delivery is conducted. In addition, the development of an assessment strategy should consider the purpose of the evaluation results and it should always be planned simultaneously with the preparation of learning activities. Therefore, similar to assessments in face-to-face education programs, online assessments in higher education also help educators make important decisions that affect students and the educational process.

Nonetheless, it is important to note that the learning context of online environments are quite different compared to the traditional setting. For example, while assessments are conducted face-to-face and synchronously in the traditional context, online assessments can be conducted both synchronously and asynchronously. Moreover, unlike the traditional assessment approaches that are used in typical face-to-face programs, online

assessments are conducted electronically using digital technologies. This means that the design, test implementation, recording the response and providing the feedback are all completed using ICT (Alruwais, Wills & Wald, 2018). The term “online assessment” hence refers to the end-to-end electronic assessment process in which ICT is used for the presentation of recording responses and assessment activities (Hamdan, Ashour & Daher, 2021). As Gikandi, Morrow and Davis (2011) pointed out, the distinct characteristic of the asynchronous nature of interactivity among teachers and students in online context requires educators to rethink online pedagogy in order to support meaningful learning and its assessment. Educators need to keep in mind that assessment used in the traditional context may not be effective when applied to an online learning context where the learning environment is significantly different (Galanis, Laskari, Meletiou & Vrahatis, 2009; Hamdan et al., 2021).

Hence, it is important that the traditional assessment methods are revisited to explore effective ways to assess learners in online learning environments. Traditional assessment techniques and strategies must be revised and reconstructed to suit the needs of online settings to ensure whether what is intended to be measured through assessments is measured accurately and to ensure whether it truly reflects what students have learnt. Failure to modify traditionally employed assessments might have significant long-term consequences for students’ educational trajectory and the potential career progression. Therefore, it is vital for HEIs to have a clear understanding of a well-designed assessment process that concurrently informs teaching and promotes learning (Beebe, Vonderwell & Boboc, 2010).

### **Online assessment related challenges experienced by students**

The Covid-19 pandemic triggered HEIs worldwide to adopt online learning abruptly, replacing traditional teaching and learning methods with online learning methods using digital tools. Concurrently, this also led to the widespread adoption of online assessments as the only means viable to assess learning outcomes during the Covid-19 pandemic. Unlike the difficulties experienced by online learners and educators in well-established universities which had been offering carefully planned and designed online programs, for many the forced shift to an online setting due to Covid-19 created unique and disparate challenges. As Sievertsen and Burgess (2020) pointed out, this mode of assessment is something unconventional for students, presumably translating into tougher assessment challenges than usual. Recent publications highlight the challenging nature of online assessments in providing comparable assessments and examination conditions to the pre-Covid-19 face-to-face provision (Godber & Atkins, 2021). Hence, such challenges need to be further explored and mitigated to improve the quality of online programs as online learning will continue to expand in the future.

#### *Technical issues*

Looking into the challenges encountered by students, one of the most commonly reported is related to technical aspects of taking online exams. These include not having access to relevant technological resources such as computers/laptops and the Internet, problems with Internet connectivity and the lack of adequate Internet speed (Fathima et al., 2021;

Mirza, 2021; Ho & Ha, 2021; Alsadoon, 2021). The instability of Internet connections was a major problem for many students, especially for those from low socio-economic regions (Fatima et. al, 2021; Wibowo, Grandhi, Chugh & Sawir, 2016). Frequent interruptions while taking an online exam, especially in a timed MCQ test, required students to login to the assessment system repeatedly, which negatively affected their performance (Khan & Khan, 2019). In addition, several researchers have reported technical difficulties such as system failure, overheating of equipment during online exams or requiring charging, incompatibility of students' computers/laptops with assessment software, and assessment design formats, electricity/power failure, bandwidth issues when images and video are embedded, inherent distrust for technology, and background noise if all microphones are kept unmuted, as significant barriers students experienced while taking online assessments (Fathima et. al, 2021; Mirza, 2021; Khan & Khan, 2019; Shraim, 2019).

#### *Fairness and equity*

Another issue with online assessments is related to fairness and equity. A study conducted by Sharadgah & Sa'di (2020), showed that online assessment did not provide 'a level playing field' to all students since some students did not have equal access to technological resources or the Internet. Studies show that in some cases students had to share devices with other family members who also needed them to do their work (Alsadoon, 2021) as "work from home" became a norm during the COVID-19 pandemic. In traditional assessments, whether formative or summative, almost all students meet in the same room under similar conditions. However, when taking assessments online, the conditions such as environment, timing, and resources available differed, which affected students' overall performance. It has been found that where Internet speed is slow, students have been placed at a disadvantage in online assessments with time limits, especially when the tests taken had images and videos that required high bandwidth (Fatima et al. 2021). In a study that explored students' perspective on online assessment practices it was found that 79% of students who participated in the study disagreed that online exams are fairer than paper-based ones (Shraim, 2019).

#### *Technological competency*

Another factor that acts as a barrier to performing well in online assessments is related to the digital literacy and competency of students. It was found that some students lacked the required technological skills such as navigating through the systems used for assessments (e.g., learning management systems (LMS) or specialised assessment systems), indicating that they needed training to familiarise themselves with online assessment platforms, test formats and the digital tools used (Al-Maqbali & Hussain, 2022; Shraim, 2019). It was also important to note that in a context where English language is not the learners' first language, their interaction with the LMS/ assessment system also acted as a barrier since such systems' interfaces often used English language (Shraim, 2019). Moreover, students' inability to type fast on a keyboard was also reported as a concern for many students as they felt they were at a disadvantage, although typing allowed them more flexibility to edit their answers (Khan & Khan, 2019).

*Effect on mental and physical health*

From the students' point of view, another important area of concern was the affective aspect of online assessments, particularly online exams. Rahmani (2021) and Shraim (2019) found that online exams elevated students' level of anxiety and exam stress. Some reasons for this were reported to include fear of technical failure, interruptions of exams because of technical problems, students not being familiar or confident with the use of respective LMS/ assessment system used for online exams, lack of adequate ICT skills, poor design of assessment items such as question wording, students not being given sufficient instruction before the exams and timed-online exam (Khan & Khan, 2019; Rahmani, 2021; Shraim, 2019). Furthermore, rigid technological settings could minimise personal engagement with educators in online assessment contexts, and inexperience with new testing formats were also reported as sources contributing to psychological stress for students (Khan & Khan, 2019; Tuah & Naing, 2021). Students were apprehensive about accepting online assessment due to difficulties in breaking past habits they were accustomed to (Khan & Khan, 2019). Some reported elevated health problems associated with computer use for long periods of time leading to excessive strain on eyes and triggered headaches (Khan & Khan, 2019).

*Application in diverse disciplines*

The literature also shows that students found it difficult to adjust to online assessments, particularly when attending to online assessments in specific disciplines and subjects, due to system incompatibility with specific disciplines. For example, Wibowo et al., (2016), reported that e-exam systems lack the capacity to allow students to draw graphs to illustrate their understanding in courses like networking. Similarly, Khan & Khan (2019) found that students from science disciplines found it difficult to type equations, draw models, and perform calculations online. Students accustomed to writing on paper to work out and make side notes when solving specific problems requiring calculations or algebraic manipulations found it difficult to keep their focus on screen when attending MCQs for subjects like mathematics (Shraim, 2019). Hence, for subjects like mathematics, they preferred the traditional way of test taking (Shraim, 2019).

These experiences shared by students indicate some reservations in embracing online assessments, depending on their disciplines, socio-economic background, familiarity, and digital competence. It also indicates that online assessments as it is being practiced currently is not compatible with all disciplines and does not fully serve student's needs as expected. Hence, this is an area that is worth exploring further in different contexts, especially in low resource circumstances.

Building on the above grounds, our study was carried out to answer the following research question: What were the challenges experienced by students in implementing online assessment at the time of Covid-19 pandemic in Maldivian Higher Education Institutions?

The challenges are explored from both students' and educators' perspectives to get a holistic understanding of the obstacles that need to be overcome if we are to continue assessing learners online. Understanding these challenges are important as online learning and program offerings have expanded post-Covid in many parts of the world including

Maldives, providing new opportunities for students from diverse backgrounds. Findings of this study may help HEIs in identifying ways to improve assessment practices applied in online programs or even in blended programs. Hence, to assure the quality of these programs, it is vital that reliable assessments are delivered. This can be done by addressing the challenges faced by students during online assessments. So far, no study has explored this area in the Maldives, a geographically dispersed small island nation.

## Method

For this study, a qualitative technique was used as the research method. According to Fraenkel and Wallen (2003) and Glesne (1999), qualitative research provides an insight of a situation or phenomena that conveys the story. A qualitative technique was deemed appropriate for carrying out this research since it enabled for greater depth and meaning to be gained based on individuals' online assessment experiences, as well as their opinions and feelings.

## Participants

Using a purposive sampling strategy, a total of 30 students and 30 lecturers representing 10 different HEIs were selected for the study. The inclusion criteria were based on participants who had experienced at least one semester of online assessment. These participants were purposefully selected based on maximum variation technique and students from eleven different disciplines were included.

## Data collection

The interview guide questions were designed using current literature, and were pre-tested on three academics and three students. Semi structured face-to-face interviews were conducted directly by the researchers and held at the convenience of the participants, lasting about 45 minutes. All the interviews were audio-recorded with the interviewee's consent and notes were taken as a backup to the audio recording and to record non-verbal cues.

## Data analysis

Recorded interviews were transcribed and verified against the original recordings. Data were analysed using the six steps of thematic analysis outlined by Braun and Clarke (2006). Thematic maps were used to connect the topics of this study and describe the data in rich detail. In addition, *ATLAS.ti 8* qualitative data analysis and research software was used to supplement the analysis. This aided in organising the data in a logical and appealing manner, resulting in less manual activities. To confirm the consistency and validity of the findings, the transcripts were shared among the team of researchers, analysed independently and then discussed together to identify the common themes (Creswell, 2014).

## Findings

Six major themes emerged as challenges experienced by students during online assessment in Maldivian higher education institutions. The six major themes include technical difficulties, issues related to Internet connection, insufficient skills in online assessment, inadequate study space, issues related to feedback mechanism and exam stress and anxiety.

### Technical issues

One of the most prominent issues raised by students was the technical issues regarding students' computers, laptops, electricity supply, and most importantly the learning management system. Students expressed their concerns in completing the exam on time due to 'heating up the laptop' and a computer getting 'stuck'.

It was found that when technical issues occurred, students were either unaware of how to reach out to technical support teams established in the HEIs, or such a system was not in place, or even in place, it is not responsive to students' needs.

Stressing on the technical issues regarding the learning management systems, students commented that they believe technical issues will be there in 'almost all the applications as none of them are bug free'. Some students have faced major technical issues with the learning management system due to server overload. As mentioned,

I faced some issues with uploading the paper during the exam. I think that is because a lot of students are using the Moodle server at the same time. So, it takes time to upload, and the allocated time might run... (Student)

Lecturers also expressed the chaos they had faced due to the technical issues experienced by the students.

Students kept texting and calling when they had connection or submission issues. So, I had to deal with these. In one exam it was chaotic (Lecturer)

In addition, participants highlighted the unnecessary mental toll they had experienced due to the technical issues during the online exam.

### Internet connection

Although technical difficulty was found to be the most prevalent challenge faced by students, it was found that Internet connection and affordability was 'the biggest problem' for some students.

Similarly, lecturers identified that Internet connection was an issue for some students especially for the students living in the islands. However, they believed that there are students who take advantage of this issue, which the lecturers felt helpless about.

At home everyone was using the Internet. So, the connection was a problem. When we give group work, maybe they deliberately do it, or maybe just the connection... When I enter the breakout room, there will be 1-2 students (Lecturer)

Lecturers admitted that they have limited online exam options due to the Internet connectivity issues, which would affect the fairness and quality of online assessments. Lecturers expressed the problems of Internet availability and connection faced by students when they give real time MCQ embedded in Moodle [LMS] or other interactive online activities, which eventually made them give only uploading and downloading types of exams.

HEIs were aware of such difficulties students may face. Hence, one lecturer revealed that in the institute where she worked, they changed the schedule of online exams as they expected to have issues in Internet connections for some students if given at the end of the month. In Maldives, Internet providers offer two forms of connections, limited and unlimited. Those who subscribe to limited connection packages will continue to get access, but at limited speed.

### **Insufficient digital skills**

Both students and lecturers articulated difficulties due to the lack of technological skills of the students which led to an unfair disadvantage for some students in their academic results as well as their mental health. It was revealed that students in elderly age cohorts had more issues due to their unfamiliarity in digital skills. Similarly, students expressed the difficulty in typing the exams in subjects like mathematics, accounting, Dhivehi (national language for Maldives) and Arabic.

As noted,

Google form when refreshed, all the answers were gone... (Lecturer)

Online exams were very difficult. I was slow to type the answers to some of the questions and could not complete it. So, it affected my results (Student)

Moreover, it was found that some students lacked skills like accessing the exam paper, typing, changing Microsoft Word documents to .pdf format, scanning, changing .jpg to .pdf, and so on.

### **Unfavourable home environment**

Considering the small living space in the Maldivian context, most of the participants, both lecturers and students, expressed the difficulty of doing exams in their living space, which was not very suitable for undertaking controlled exams. As highlighted,

At home we are doing the exam, so the fear that there might be noise from home is there. So, it was difficult for me (Student)

It was evident that the noise was a major disruption when attempting an online exam at home. However, in addition to noise, the reliability of the Internet connection and IT equipment, and other family distractions were challenges during online exams. Students identified that they could not concentrate peacefully during exams due to ‘nearby construction work’, ‘kids’ and other family responsibilities which they would not have faced in on campus exams held at college/university. Evidence from lecturers supported that the students had to face difficulties during their assessment due to the unfavourable home environment. As expressed,

Live exams are troublesome for many students. They do not have good workstations, camera... They suffer a lot to keep the video and audio on. Lots of background scenes going on. Perhaps this may not be that convenient or effective... because of their living conditions (Lecturer)

It was found that in some disciplines, lecturers could not conduct quality online exams due to the lack of resources and poor home environment of the students. As stated by language lecturers, they needed to see facial expression and hand gestures during an assessment which they could not do due to the unavailability of cameras at students' places. Similarly, marine science lecturers highlighted the difficulty of conducting a virtual lab exam due to the lack of Internet connectivity and unfavourable exam space at student's places.

### **Feedback mechanism**

A majority of the students raised the concern of not receiving timely and constructive feedback during online formative assessments. It was revealed that students had to wait for a long period of days to receive their feedback for the assessments, in which they ended up not receiving even when they attempted the next assignment. This impacts the quality of their continuous assessments. Students highlighted that during face-to-face classes they could meet and ask lecturers regarding their assessment and receive a form of feedback on the spot which was not possible during online assessments. In addition, some students expressed that it was easier for them to clarify their doubts on feedback during face-to-face class rather than online mediums.

Moreover, lecturers highlighted that “marking long answers using a computer was hard” which eventually leads to sharing feedback late to students. As a lecturer explained,

I like marking on the paper. We can't print. We were at home. We had to just look at the paper and the rubrics and mark. It was very difficult because the comments could not be made. But some of us are getting better at this (Lecturer)

These findings indicate that lecturers' preferences for traditional ways of marking and giving feedback had an indirect effect on students' performance.

### **Stress and anxiety**

Data from the students revealed that online assessments caused extra stress for some students due to the expected occurrence of technical issues. As expressed,

I felt like I was someone who doesn't know how to swim in a ferry on the rough seas, I was that scared of losing the Internet connection. The fear of failure was there (Student)

On the other hand, some students had a more relaxed experience during the online exam as compared to the physical exam.

Exam phobia, anxiety... these things are reduced when we do online exam... we have our own space, and it is less stressful (Student)

It has also been found that exam stress and anxiety was prevalent during the first-time students attempting online exams and after that they preferred online exam rather than physical exams when considering the exam stress.

## **Discussion**

Although there are similarities in our study's findings with the international literature surrounding online assessment, some significant results were revealed based on the unique context of the Maldives. Thus, the findings showed numerous challenges that need to be addressed and managed by the HEIs; however, the findings also indicated a resilience and a willingness to persist and overcome these challenges.

The major challenge echoed in this study was in the technical issues category, concerning topics such as the learning management system being down, unstable Internet connectivity, electricity failures and Internet connection speed. These issues have been reported by both students and lecturers. Students reported how the technical issues were experienced and their reaction to it while the lecturers expressed the 'chaotic' situation they were in due to these issues encountered by the students as well as themselves. These findings support the general literature on technical difficulties encountered while online assessment is in progress by students (Alsadoon, 2021; Fathima et al., 2021; Mirza, 2021; Ho & Ha, 2021) and lecturers (Fatima et al, 2021; Ghanbari & Nowroozi, 2021; Perwitasari, Astuti & Atmojo, 2021; Sharadgah & Sa'di, 2020). It is worth noting that reports of such technical issues from the students based in outer atolls were higher in frequency as compared to students in the capital city.

In addition, lecturers highlighted that connectivity issues negatively affected students' performance, especially in MCQ tests which had to be completed in a preset time. This, corroborated findings by Khan & Khan (2019) who reported that constant interruptions in timed MCQ tests required students to login to the assessment system repeatedly which negatively affected their performance. Consequently, our study found that the lecturers needed to limit the online assessment options, such as interactive questions, owing to Internet connectivity issues. Similar findings have been reported in several studies on online assessment (Fatima et al, 2021; Ghanbari & Nowroozi, 2021; Perwitasari, Astuti & Atmojo, 2021; Sharadgah & Sa'di, 2020). Consistent with other technical issues associated with geographically dispersed islands, connectivity issues were higher than in the capital city as Internet bandwidth provisions are low in the outer atolls. This raises the concern of the fairness of online assessment. Therefore, HEIs need to find efficient Internet

connectivity packages or providers in order to minimise disruptions of the smooth flow of online assessment processes.

The challenges of being unfamiliar with technology, limited technological knowledge and lack of technological skills by students hindered the effective implementation of online assessment. These findings complement similar studies where knowledge and familiarity with technology were found to be a major obstacle in conducting online assessment (Al-Maqbali & Hussain, 2022; Ghanbari & Nowroozi, 2021; Shraim, 2019). This raises the question of the level of training or orientation on digital tools/ technology that is provided by HEIs in preparation for online assessment. It could be that the training provided for students was insufficient, due to time constraints as the shift to online assessment was sudden as a result of the Covid-19 pandemic. In planning improvements in student training to be provided by HEIs, so that the online assessment is conducted in a more effective manner, particular attention could be given to older students who are unfamiliar with the technology and lacking in basic IT skills, especially in particular programs, such as the Quranic and Imamship programs.

With regards to the challenge of students' home environments, the findings of this study support Fathima et. al (2021), Mirza (2021), Khan & Khan (2019) and Shraim (2019). Students expressed the difficulty in doing online assessments at home, the main reason being the background noise when microphones are unmuted, revealing this as a major obstruction for online assessment. This could be due to the reason that the majority of the students both in outer atolls and in Malé live with extended families. Also, many students live in shared accommodation with 3 to 5 roommates for low rent, which is common in Malé, the capital city.

The challenge of not receiving feedback in a timely manner from lecturers was raised by the students. Delays in the online formative assessment feedback hindered the progress of the students as they had to submit the second assignment without the feedback from the first one. This finding was supported by lecturers where they admitted having difficulty in marking long answers on computers which resulted delaying feedback to students. These findings complement Mirza's (2021) study in which educators reported difficulty in correcting questions with open responses such as explaining things. Additionally, students expected individual feedback from lecturers on weekly online tasks, whereas lecturers' views are the opposite. However, the lecturers provide general feedback that is considered sufficient. Thus, lecturers need to be well versed with new methods of marking and HEIs need to ensure that skills and knowledge are developed through professional development and providing relevant training to lecturers.

Due to the uncertainty and unpredictable nature of the Covid-19 pandemic, the level of anxiety was high among all. This was observed and reported among the students at the time of online assessment. The online assessment itself adds to the level of anxiety, one reason is that assessment being a new method and another reason is the exam stress itself. The fear of getting interrupted, unable to upload the answer script on time due to technical failure and unfamiliarity with testing formats elevated the students' level of anxiety. Similar findings were reported in online assessment studies which showed that

online exams elevated students' level of anxiety and exam stress (Khan & Khan, 2019; Rahmani, 2021; Shraim, 2019; Tuah & Naing, 2021). Thus, HEIs need to establish support structures or provide mental health services for students and lecturers so that the psychological and mental stress may be minimised.

## Conclusion

This study examined the online assessment challenges faced by students during the Covid 19 pandemic, revealing several serious challenges which need to be addressed. The common challenges include technical issues like an unreliable Internet connection, power outages, slow speeds of Internet connections, and a malfunctioning LMS. Other challenges faced by the students included noise levels in home environments which distracted them doing online assessments at home. Students complained that timely feedback was not received from lecturers. Moreover, students reported that they faced mental health issues like anxiety and stress.

Despite all the revealed challenges, higher education institutes in the Maldives and all over the world continue to apply online assessment strategies for some critical purposes. Hence, HEIs must simultaneously assume accountability and upgrade the current online infrastructure and resources to support smooth functioning of online learning environments. At the same time, sufficient training should be provided to students for successful participation in online assessments. The HEIs should also ensure that the students are well equipped with the latest technological knowledge that would allow them to face the technical issues and also to enhance their confidence in participating in online exams. Technical support and counselling services should be arranged at institutions to help accommodate the needs of students.

As a future perspective, this research can be extended in different directions. First, the results and discussion in this study were based on qualitative findings. An avenue for future research is to investigate the challenges using a quantitative approach to help generalize the findings to develop a holistic idea of the situation. Second, future research could consider doing a more comprehensive study adapting a mixed method approach. In addition, a lot of issues found from this study are related to technological issues, hence, it would be worthwhile to investigate this aspect further. Last but not least, it is significant to look into the issues experienced by the lecturers during online assessments.

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## Appendix 1: Interview questionnaire

### Section 1: Introductory remarks

<p>Introduction Key Components:</p> <ul style="list-style-type: none"> <li>- Thank you</li> <li>- Your name</li> <li>- Purpose</li> <li>- Confidentiality</li> <li>- Duration</li> <li>- How interview will be conducted</li> <li>- Opportunity for questions</li> <li>- Signature of consent</li> </ul>	<p>Hello and Good Morning/Afternoon.</p> <p>I want to thank you for taking the time to meet with me today.</p> <p>My name is Mr/Ms. _____ and I would like to ask you are few questions about online assessment in your College/University. Specifically, looking for information and feedback or questions.</p> <p>The interview should take less than an hour. I will be recording the session because I don't want to miss any of your comments. I would still be taking notes during the interview sessions. Please be sure to speak up so that I won't miss any of your valuable comments.</p> <p>All responses will be kept confidential. This means that your interview responses will only use strictly for research purposes and my report will not identify you as the respondent. Relax, sit back and answer the questions in your honest opinion. Do you have any questions for me? If you need further clarifications, do ask. Can we start the interview?</p> <p>Interviewer Signature:</p>
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### Section 2: Interview questions (semi-structured)

Interview questions for \_\_\_\_\_ student/lecturer.

Date:

Interviewer:

Interviewee:

Positions:

#### Opening remarks:

Good Morning/Afternoon

It is nice to meet you. Thank you for taking the time to do the interview. I have a few questions about online assessment. I know this is a familiar topic. Please relax and share with me as much information as you can. Please be ensured that your personal information and the interview notes will be kept strictly confidential. I will ask general questions. If you are not comfortable answering the question I have asked, we can skip to the next question.

1. Please give an introduction about yourself and the course you do?
2. Please tell me how many semesters/trimesters you have experienced online assessment?
3. What are the online assessment techniques (continuous assessment) you have used?
4. What are the online assessment techniques (final assessment) you have used?

5. What are the online assessment techniques used by your college or university?
6. Ask follow up questions regarding the perception of the interviewee regarding the usefulness of online examinations in terms of pedagogy, validity, reliability, effective factors, practicality and security.
7. How did you feel when you were informed that you are going to have online assessments?
8. Do you think online assessment contributed to your performance in your learning/teaching? If yes, how? If not, why do you think so?
9. Do you think online assessment contributed to your achievement in your learning? If yes, how? If not, why do you think so?
10. Do you feel you are skilled enough for the online assessment methods/ techniques used? Explain how?
11. What training was provided for you to prepare you for the online assessment? If so, how? If not, what would you require?
12. What difficulties if any, did you encounter during your online assessments? and how did you resolve it?
13. Did you receive support/help from others during your online assessments? If yes, who helped you and how? Colleagues? Institutional support? Students? SOPs?
14. How would you describe your experience with online assessment techniques?  
Is it a positive or negative experience? Why do you say so? What are the benefits you have experienced? What did you like most while using the online assessment system? What are the challenges you have experienced? What are the difficulties faced while using the online assessment system? How about computer familiarity? Is the Medium of online assessment (Moodle/Blackboard) easy to use? Is the screen and interface design of this online assessment system appropriate and convenient to use? Does the online assessment system have a positive or negative effect on the learning process? How prepared are the lecturers/ students for online assessment? How well is the implementation of online assessment?
15. Can you recall the first time you experienced online assessment? Please share your experience! Is it a positive or negative experience? Why do you say so? What are the benefits you have experienced? What did you like most while using the online assessment system? What are the challenges you have experienced? What are the difficulties faced while using the online assessment system? How about computer familiarity? Is the Medium of online assessment (Moodle/Blackboard) easy to use? Is the screen and interface design of this online assessment system appropriate and convenient to use? Does the online assessment system have a positive or negative effect on the learning process? How prepared are the lecturers/ students for online assessment? How well is the implementation of online assessment?
16. Do you find online assessment easier compared to physical exam? Why? Time? Flexibility? Ease of use? Preparation
17. How confident are you now in using online assessment than before or compared to first/second semester?
18. Can you explain how online assessment experience can be improved for students/lecturers? Through University support? By yourself?

19. Based on your experience, what would be your suggestions for colleagues about online assessments?
20. Based on your experience, what would be your suggestions for other students about online assessments?
21. If, in the future, an option of face-to-face and online assessments were given, which would you choose and why?
22. Is there anything else you would like to add?

Thank you, Sir/Madam, for spending XX minutes with me. Your response is much appreciated!

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