

## Assessment of Online Learners in Thailand's Distance Education Programmes: Lessons from the COVID-19 Pandemic

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### Abstract

This study aimed to examine the significance of assessment before and during the COVID-19 pandemic, synthesise the assessment processes from these periods, present guidelines for assessment during the pandemic, and explore obstacles, gaps, challenges, and lessons learnt related to assessment in distance education. A mixed-methods research approach was used, combining qualitative data from interviews, focus groups, and document reviews with quantitative data from a survey of 591 students at Sukhothai Thammathirat Open University. The resulting data was analysed using descriptive statistics and content analysis, yielding the following findings. (1) Before the pandemic, stakeholders recognised assessment as a crucial component of teaching. During the pandemic, the university changed to online learning and assessment, and made assessment crucial in maintaining standards and fairness. The university revised and implemented educational plans and anti-cheating strategies for online exams, and improved the digital skills of staff and students. (2) The university adjusted policies to support assessment during the pandemic by promulgating regulations accommodating the change, developing exam tools, preparing for exam administration, managing exams, and ensuring that online exams were as standardised and fair as traditional exams. (3) The university upgraded its digital infrastructure, retrained staff and students in problem-solving skills, promoted academic integrity, and enhanced the security of online systems. (4) The university pre-tested online systems to improve server efficiency, developed tools to maintain assessment standards, and provided technical training for staff and students.

*Keywords:* COVID-19 pandemic, distance education in Thailand, distance education programmes, learner assessment, online exam, online learner assessment,

### 1. Introduction

The COVID-19 outbreak significantly impacted activities across various sectors, including the economy, society, and particularly education (Katole, 2023). Higher education was notably affected, as many learning activities, such as in-class learning, laboratory sessions, and examinations, traditionally required face-to-face interaction. Because COVID-19 spreads through respiratory droplets and contact, many of these activities had to be cancelled (Guangul et al., 2020).

Higher education institutions were thus compelled to adapt by transitioning teaching, learning, and assessment to online platforms in order to minimise travel, promote social distancing, and reduce the spread of the virus (Mishra et al., 2020).

In Thailand, this rapid change necessitated higher education institutions, including Sukhothai Thammathirat Open University (STOU)—the only open university in Thailand specialising in distance learning—to adapt by incorporating new educational technologies and innovations for online teaching, which enabled students to engage in self-directed learning. Saikia et al. (2024) found that online learning promotes self-directed learning, enhances communication skills, and raises technological awareness among learners, aligning with the Sukhothai Thammathirat Open University [STOU] Act (1978), in which Sections 5 and 6 state that the university is a non-classroom-based institution and education must be provided through teaching materials or other methods that enable students to learn independently without needing to attend physical classes. Sato et al. (2024) found that the pandemic swiftly altered the educational landscape, particularly demonstrated by the shift towards online and distance learning, which has created opportunities for more inclusive, flexible, and participatory education. The integration of online teaching innovations into digital learning environments promoted effective self-development among students, consistent with STOU's emphasis on self-directed learning.

The pandemic posed significant challenges to STOU's management, particularly in the administration of exams for undergraduate students and learners in certificate programmes. Social distancing requirements prohibited in-person examinations, making computer-based or online approaches better suited at the time. Both walk-in exams and the offline STOU English Proficiency Test (E-Testing), commonly held physically before the pandemic, were unfeasible due to this same reason. Paper-based exams at provincial centres were also suspended to limit travelling and minimise transmission of the virus (STOU, 2021).

To ensure that students could complete their educational progress as scheduled, STOU collaborated with the Thai Association of Institutional Research and Higher Education Development to develop an online examination system for undergraduate and certificate students. This system adhered to governmental regulations and standards while ensuring the integrity of the assessment process, including measures to monitor and supervise exams, and prevent cheating. The first online exams were conducted during the supplementary session of the 2019 academic year (STOU, 2020a).

During the initial implementation of the online system, the university encountered a number of technical and systems-related issues that required urgent solutions to ensure a smooth exam delivery process. In preparing for their exams, students also encountered challenges with technological skills, access, and device readiness. In addition, generational differences among students affected individual ability to adapt to online exams. For instance, older students expressed anxiety and reluctance to using technology. These challenges affected their participation in online exams. STOU (2020b) identified specific issues encountered by students, such as difficulties in verifying individual identity, difficulty in logging into the system, disconnections from the system due to unstable internet access, failing to access the system in time, and power outages during exams. Butler-Henderson and Crawford (2020) emphasise that the university must understand and address these challenges to reduce students' anxiety and mental fatigue during online exams.

As members of OU5, a research network comprising five open universities in Southeast Asia, STOU has collaborated with Open University Malaysia, University of the Philippines Open University, Universitas Terbuka, and Hanoi Open University. Under a Memorandum of Agreement signed on 9 May 2014, the five members thus agreed to conduct annual joint research (Ngudgratoke et al., 2020). In 2021, they agreed to work on the topic, "Online Student Assessment: Lessons Learned from COVID-19," aiming to use the findings to enhance teaching and assessment in distance education during and after the pandemic.

The researchers recognised the challenges and opportunities in improving the online system, given that exams are central to assessing learning outcomes of open universities that rely on distance education. Therefore, the researchers aimed to study STOU's online student assessment by drawing lessons from the pandemic through a mixed-methods research (MMR) approach. This approach integrates quantitative and qualitative research, from data collection to analysis and interpretation, to yield comprehensive, in-depth,

and clear research findings (Creswell & Creswell, 2018). MMR provides a holistic understanding of the phenomenon under study and guides the development of effective online assessment. The findings from this research can be used to establish a potential model for other open universities to support online teaching and learning and develop assessment systems that can ensure fair and high-standard assessments for all students, regardless of gender, age, or location.

## 2. Literature Review

Online assessment is an open and flexible approach that has gained popularity, surpassing traditional pencil-and-paper assessments. It has become a primary method of evaluation in higher education (Yong et al., 2021) particularly during the pandemic, which forced educational institutions worldwide to transition to distance learning. Alruwais et al. (2018) identified several advantages of online assessment, such as immediate feedback for students, promotion of higher-order thinking, reduced lecturer workload, and lower institutional costs. However, online assessment still faces challenges, including lack of technological infrastructure, learners' unfamiliarity with technology, and the need for institutions to provide sufficient equipment and training to help students adapt.

Dawadi et al. (2024) found that issues such as limited access to the internet, technology, and financial resources prevented certain groups of students from participating in online activities, thereby exacerbating digital inequality during the pandemic. Despite universities' efforts to support students by offering internet packages, these were often insufficient to meet the students' diverse needs. Holden et al. (2021) highlighted the challenges posed by online assessments, particularly regarding digital equity, varying levels of technological access among students, and concerns about the reliability of assessments, such as the potential for cheating during exams. Gikandi et al. (2011) emphasise that issues related to unequal access to technology and the credibility of online assessments must be addressed.

To mitigate these challenges, flexible and diverse assessment designs are essential. Rahim (2020) proposed that online assessments for distance learning during the pandemic should encompass cognitive, affective, and psychomotor learning domains, and employ a variety of assessment methods. Almosa (2021) stressed the need for careful design of assessments during the pandemic, suggesting that not all assessments need to rely on exams, although if exams are deemed necessary, open-book formats should be used, with appropriate time allocation and standardisation. Souto-Romero et al. (2024) argued that assessment activities should be diversified to cater to different learning styles and use various tools, such as multiple-choice tests, self-assessments, individual and group work, and peer assessments.

The selection of appropriate and accessible assessment tools is crucial to ensuring fairness and effectiveness in online environments. Mahlangu and Makwasha (2023) recommended that online assessments are most effective when both lecturers and students have access to computers, digital skills, and stable internet connections. If these are unavailable, smartphones and reliable internet connections should be considered the bare necessities. Topuz et al. (2022) found that formats well-suited for online assessments include multiple-choice questions, true/false questions, and essays. Therefore, lecturers should select tools that address the varying needs of assessments in different formats.

Based on the literature reviewed, four key themes regarding online assessment during the pandemic emerged: (1) technological challenges and adaptation: both lecturers and students need to adjust to new technological tools and develop digital skills to accommodate online assessments; (2) psychological impact and perception: online assessments affect students' mental well-being, with stress arising from unfamiliarity with exam formats and concerns over exam performance; (3) integrity, fairness, and innovation in online assessments: online assessments require systems that support academic integrity and strategies to ensure fairness and equity; and (4) the pandemic's impact on assessment has led to a shift towards flexible assessment methods suitable for distance learning.

Overcoming these challenges are key to ensuring that online assessments can meet the demands of higher education institutions and improve learning outcomes. As faculty members of STOU, the researchers are particularly interested in the challenges, inequalities, and unforeseen issues that influenced the fairness and

effectiveness of student assessment in Thailand's distance learning environment during the pandemic. This study focuses on identifying key lessons in designing assessments that respond to online learning environments, with the aim of developing more equitable and effective assessment practices.

Thus, this study aimed to:

- i. Examine the significance of learning assessment before and during the pandemic,
- ii. Synthesise the learning assessments conducted before and during the pandemic,
- iii. Present guidelines for learning assessment during the pandemic, and
- iv. Explore obstacles, gaps, challenges, and lessons related to online student assessment in distance education.

### **3. Research Method**

#### **3.1. Research Informants and Samples**

The research informants were divided into two groups. Group 1 consisted of 25 individuals who provided in-depth interview data regarding their perceptions of the importance of assessment before and during the pandemic. Group 2 consisted of 15 participants who were placed in focus groups to discuss obstacles, gaps, challenges, and lessons learnt concerning assessment in distance learning systems. Both groups included university administrators, assessment and evaluation administrators, network and computer system administrators, educational technology administrators, undergraduate faculty members, undergraduate students, and employers of graduates. The informants were selected through purposive sampling.

The sample for studying students' opinions on assessments before and during the pandemic consisted of 519 undergraduate students currently enrolled at STOU. The sample size was determined using Cohen's (1988) method, with a 95% confidence level and a power of test ( $\alpha$ ) = 0.80. The sample was selected through convenience sampling, focusing on students who had access to technology.

#### **3.2. Materials and Tools**

The instruments comprised the following four tools:

- i. A semi-structured, open-ended interview to examine the significance of assessment before and during the pandemic, with content validity confirmed using the Item Objective Congruence (IOC) technique. IOC values between 0.66 and 1.00 indicated that the questions were valid according to Rovinelli and Hambleton's (1977) guidelines.
- ii. A four-point Likert-scale questionnaire with 12 items to gather student opinions on online examinations. The questionnaire was tested with 32 students, which yielded a high-reliability score of 0.84 using Cronbach's alpha (George & Mallery, 2010).
- iii. Document review and synthesis forms to collect and synthesise data on assessment practices before and during the pandemic.
- iv. A focus group discussion guide to facilitate in-depth discussions and explore questions regarding distance learning assessment.

#### **3.3. Data Analysis**

Quantitative data were analysed using descriptive statistics, including mean (M), standard deviation (SD), frequency, and percentage. Content analysis was used to systematically draw conclusions and interpret information from qualitative data.

## 4. Findings and Discussion

### 4.1. Findings

#### 4.1.1. *The Study on the Importance of Assessment Before and During the Pandemic*

- i. The interview results regarding the significance of assessment in distance learning systems from the perspectives of administrators, lectures, students, and employers of graduates were categorised into three areas:

- **Teaching and learning**

Before the pandemic, STOU was a leader in distance education with focus on expanding educational opportunities for both domestic and international students. The teaching model primarily relied on printed and digital media, which were supplemented with face-to-face sessions held twice per semester to enhance understanding in challenging courses, such as those involving calculations. Formative assessment contributed to 30% of the total course grade. During the pandemic, lockdowns and social distancing measures forced the cancellation of face-to-face sessions, pushing the university to begin conducting online teaching. This transition posed challenges for students in remote areas who faced difficulties accessing the internet and lacked digital readiness. This also created inequalities in access to educational resources and learning opportunities. To address these gaps, STOU provided offline materials to enhance students' digital literacy, such as course-specific compact disks (CDs) and supplementary learning documents.

- **Assessment of learning outcomes**

Before the pandemic, STOU had a well-established assessment system, featuring standardised semesterly exams and supplementary assessments. The university emphasised strict control over assessment standards, from the creation and administration of exams to the evaluation of results. For courses that are considered challenging, in-class practice sessions, which included continuous assessment, were held. Provincial exam centres provided a uniform environment for all students to sit for their exams.

During the pandemic, the university had to transition from traditional pencil-and-paper exams to proctored online exams, using online videoconferencing platforms to create virtual examination rooms. This shift brought about issues of inequality, particularly for students in remote areas who lacked access to adequate devices and high-speed internet connections, which the university addressed by implementing remedial measures and making the online examination system more flexible. While some students were able to adapt to this new approach, the university remained concerned about fairness and maintaining standards. Therefore, the university emphasised promoting academic integrity by establishing guidelines to ensure honesty during exams and uphold assessment standards.

- **Integration of technology in learning assessments**

Before the pandemic, STOU consistently integrated technology into its distance learning framework. STOU commonly uses diverse teaching materials, with printed documents serving as the primary medium designed for self-directed learning. Each course includes 15 learning units with practical exercises to foster skills development and application. Additional learning materials are provided through radio, television, and online platforms such as Moodle and YouTube, which students could access anytime and anywhere.

STOU's exam preparation process was standardised through a computerised question bank system, ensuring up-to-date exam content. Exams were reviewed by assessment and subject-matter committees to maintain accuracy. Multiple-choice exams were graded using Optical Mark Recognition (OMR), while essays were graded by lecturers, with all grades recorded and verified in a computer system before being submitted for final approval.

During the pandemic, STOU transitioned to online learning and assessments using platforms like Microsoft Teams and Webex to facilitate communication and learning. For online exams, the university established backup systems, implemented cybersecurity measures, and trained technical staff to handle emerging issues. Proctored online exams involved virtual rooms with one proctor overseeing 50 students, with video feeds from 25 students displayed on each screen to monitor student activity and prevent cheating. STOU created training materials and organised workshops for lecturers, staff, and students to learn to use e-learning systems and software like Microsoft Teams, Webex, and Moodle.

- ii. The results of content analysis from interviews with administrators, lecturers, students, and employers regarding perceptions of STOU's assessment practices before and during the pandemic are presented in Table 1.

**Table 1.** Perceptions of learning assessment practices before and during the pandemic

Issue	Before COVID-19	During COVID-19
Policies on learning assessment	Paper-and-pencil exams were administered to students in every provincial exam centre. Some districts also established separate exam centres for students' convenience.	Due to the inability to administer exams in every provincial exam centre, the assessment method was initially changed to take-home activities. Later, the university administrators saw an opportunity in the crisis and developed an online examination system. The advantages of the online system included convenience, cost-effectiveness, and ability to maintain quality equivalent to that of exam centres. Although there were initial issues, replacement exams were arranged for affected students.
The process of developing tools for learning assessment	Students engaged in self-directed learning using teaching materials and supplementary media; their progress was evaluated using pre- and post-assessment tools. Three assessment plans were used: Plan A1 (final exam), Plan A2 (midterm and final exam), and Plan A3 (in-class activities, midterm, and final exam). More than 70% of the final grade was derived from standardised tests. The university prioritised the creation of test items, involving committees responsible for drafting, verifying, and reviewing exam questions before they were printed and used.	Students continued to learn independently using teaching/learning materials and supplementary media, with only Plans A1 and A2 available for selection. Both plans were assessed through online exams. The process of creating exam questions remained the same as before the pandemic, with test papers printed each semester to ensure readiness if regular in-person exams could resume. All test papers were converted to a format compatible with the Moodle system and thoroughly checked for accuracy before use. Lecturers were required to prepare backup test items in anticipation of issues with the online exams; if not used, these would be utilised in the next round of exams.
Establishing regulations	The university adhered to the 2008 undergraduate final examination regulations, which served as guidelines for managing exams across all domestic and international test centres.	The university followed the 2021 online examination regulations for undergraduate and lower-level students, with minor amendments in 2022, to guide the administration of online exams. For paper-based exams, the 2008 undergraduate final examination regulations continued to be used.
Preparation and administration of exams	Before the exams, orientation sessions were held for coordinators and central committees. Coordinators delivered exam papers to the exam centres several days prior to the exams. This process was managed by the Office of Registration, Records, and Evaluation.	Orientation sessions were held for proctors before the exams, and students were given the opportunity to appraise the online exam system. This process was managed by the Office of Computer Services, the Office of Educational Technology, and the Office of Registration, Records, and Evaluation.
Exam supervision	The proctors, appointed from local schools serving as exam centres, worked under the coordination of STOU personnel, with two proctors assigned per exam room.	Only STOU personnel served as proctors, with each proctor overseeing 50 students via an online videoconferencing platform.
Grading and determination of exam	The grading criteria were as follows: <ul style="list-style-type: none"> <li>• Grade H (Honour): score <math>\geq 76\%</math>,</li> <li>• Grade S (Satisfactory): score 60-75%</li> </ul>	The grading criteria remained the same as before the pandemic.



Issue	Before COVID-19	During COVID-19
results	<ul style="list-style-type: none"> <li>• Grade U (Unsatisfactory): score &lt;60%, and</li> <li>• Grade I (Incomplete).</li> </ul>	

- iii. Survey results on student opinions regarding learning assessment during the pandemic revealed that more than 70% of students responded “Agree” and “Strongly Agree” to the following top five items: “I feel anxious during the online exam.” (79.2%), “Online exams help keep me safe from the pandemic.” (78.5%), “I feel that online exams help save personal expenses.” (72.9%), “I am prepared to follow the online exam regulations.” (72.9%), and “I am not confident in the online system.” (57.4%). Additionally, responses to items such as, “I like the online exam system,” “I would prefer to take online exams whenever it is feasible,” “Online exams provide me with the opportunity to search for answers,” and “I would prefer not to take an online exam” showed a nearly equal distribution of “Agree” and “Disagree” (44%–54%). This indicates that approximately half of the students preferred and had a positive attitude towards online exams, while the remaining half had a negative view of the online system. Their overall opinions are presented in Table 2.

Table 2. Student opinions on learning assessment during the pandemic

Item	M	SD	%			
			Strongly agree	Agree	Disagree	Strongly disagree
I feel anxious during the online exam.	2.92	0.84	21.00	58.20	13.50	7.28
Online exams help keep me safe from the pandemic.	3.04	0.80	29.60	48.90	17.40	4.06
I feel that online exams help save personal expenses.	2.22	0.85	25.50	47.40	21.00	6.09
I am prepared to follow the online exam regulations.	2.37	0.85	24.50	48.40	20.60	6.43
I am not confident in the online system.	2.93	0.80	11.00	46.40	28.30	14.40
I like the online system.	2.54	0.87	21.20	33.00	34.90	11.00
I prefer to take online exam whenever it is feasible.	2.33	0.72	21.00	29.80	35.50	13.70
Online exams provide me with the opportunity to search for answers.	2.64	0.93	6.60	41.30	34.70	17.40
I prefer not to take an online exam.	2.58	0.97	7.11	37.40	27.20	28.30
I am confident of scoring high in an online exam.	2.91	0.84	4.57	34.20	50.60	10.70
Online exams increase my expenses.	2.09	0.83	5.58	33.00	39.30	22.20
I would suggest that my friends avoid taking online exams.	2.23	0.94	4.57	25.2	44.70	25.50

4.1.2. *Synthesis of Learning Assessments Before and During the Pandemic*

Based on documents reviewed and interviews with administrators, lecturers, students, and employers, the synthesis of learning assessments before and during the pandemic can be summarised into the following six areas:

- **Policy development for learning assessment**  
 Before the pandemic, STOU’s assessment policy primarily relied on final exams, which contributed to 70% of the total grade. This policy was designed to ensure that the exam results accurately reflected students’ knowledge and abilities. For challenging courses, additional support was provided through self-directed learning and practical exercises, accounting for 20% to 30% of the grade.

During the pandemic, STOU maintained the same grading weight but shifted from physical exam centres to online exams. The university developed an online system to maintain the same standards and fairness, introducing strict policies to prevent cheating, such as online identity verification and live proctoring.

- **Development of assessment tools**

Before the pandemic, STOU used tests as the primary assessment tool, with a rigorous quality control process. Test creation involved instructors designing the exams, which were then reviewed by academic and evaluation committees to ensure fairness and accuracy.

During the pandemic, the same process remained in place, but additional measures were introduced to adapt paper-based exams for online use, such as converting graphs, images, tables, and special characters. Both exam centres and online exams used the same test sets to ensure consistency in quality.

- **Establishing and enforcing regulations**

Before the pandemic, STOU had strict exam regulations for exam centres. These were regularly updated to keep abreast with global changes.

During the pandemic, the university introduced online exam regulations to minimise cheating, including identity verification through the STOU SISA app and webcam monitoring. Enforcing these rules presented challenges, such as unstable internet connections and other technical issues, prompting STOU to continuously improve these measures to ensure that online exams remained as fair as physical exams held in provincial exam centres.

- **Exam preparation and administration**

Before the pandemic, STOU had rigorous preparation processes for exam centres, coordinated with schools that served as exam centres, and provided orientation for staff involved in exam administration.#

During the pandemic, the university prepared for online exams by setting up networks, computers, software, and training of personnel. Initially, technical issues, such as system overloads, occurred, prompting the university to improve network capacity and conduct additional staff training to ensure smooth exam operations.

- **Exam supervision**

Before the pandemic, STOU appointed school personnel as exam proctors, with university staff coordinating and monitoring the process. Each exam room had two proctors, and strict regulations were enforced to ensure transparency and fairness.#

During the pandemic, STOU appointed internal staff to proctor and supervise online exams, with one proctor supervising 50 students via webcam monitoring. Although online exams posed challenges in managing technical issues and maintaining exam integrity, the combination of live proctoring and webcam monitoring helped reduce the risk of cheating and built trust among students.

- **Grading and evaluation of exam results**

Before the pandemic, STOU used a meticulous process to collect and verify paper-based answer sheets. Exams were supervised by lecturers and processed using OMR machines. The grading process was vital to maintaining quality and standards, with strict regulations to ensure fair and reliable results.

During the pandemic, online exam submissions were automatically processed, but the grading and evaluation system remained the same. Scores from both testing centres and online exams were combined and reviewed by an academic committee that finalised the results. Additionally, complaints or allegations of cheating were investigated, with final decisions made within 45 days after the exams.

#### 4.1.3. *Guidelines for Learning Assessment During the Pandemic*

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Based on focus group discussions with relevant stakeholders, learning assessment guidelines during the pandemic can be summarised into the following two aspects:



- **Administration of online exams**

The administration of online exams used several strategies and tools, including: (1) establishing and rigorously enforcing an academic integrity policy with strict penalties for cheating; (2) using shuffled options to reduce the chances of answer-sharing; (3) using test items that are designed to prevent cheating, such as open-ended questions that measured higher-order thinking; (4) addressing technological inequalities by partnering with internet service providers to offer special rates for students; (5) providing training on how to use the online system; (6) setting up a consultation centre for student support; (7) developing a stable and secure online system; (8) collaborating with local community organisations to provide internet access to students in remote areas; and (9) developing a fair online assessment system utilising modern tools.

- **Online student assessments**

Online learning assessments included: (1) project-based assessments, which focus on evaluating students through projects such as research, essays, and presentations. These measured higher-order skills like critical thinking, problem-solving and communication. The flexibility of this method allowed students to demonstrate their strengths and align their work with course learning outcomes; (2) self-reflection, which involves self-assessment through written reflections, portfolios, and other forms of self-evaluation. This method helped students assess their own progress, identify areas for improvement, and measure skills like critical thinking, problem-solving, and self-awareness; and (3) peer assessment, which involves peer critique and feedback that offers diverse perspectives and useful insights, and measures skills in communication, teamwork, and collaboration.

#### *4.1.4. Obstacles, Gaps, Challenges, and Lessons Learnt in Distance Learning Assessment*

- **Obstacles**

- i. Adapting to new technologies: the university needed to invest in new software and tools such as a learning management system (LMS) and online exam monitoring tools, which required significant time and resources. Staff also needed to be trained on how to use these new tools.
- ii. The reliability of online assessments: with online exams being susceptible to dishonest practices, the university needed to invest in anti-cheating tools and measures.
- iii. Technological inequalities: some students lacked access to technology or had poor internet connectivity, making it difficult for them to participate in online assessments, thus affecting overall fairness and performance.
- iv. Lack of engagement and motivation: distance learning often causes students to feel isolated and have limited interaction with peers and instructors, which reduces their motivation to learn.
- v. Limited access to resources and support services: exam preparation became more difficult when students struggled to access textbooks and services such as tutoring and counselling.

- **Gaps**

- i. Sustainability of technological investments: the lack of a long-term strategy for maintaining and upgrading tools and infrastructure raises concerns about the durability of these investments beyond their use during the pandemic.
- ii. Technological equity: measures to address the digital divide are insufficient, with no targeted initiatives for disadvantaged students, such as subsidised devices or better internet access.
- iii. Efficacy of anti-cheating tools: while monitoring systems are in place, they do not fully eliminate cheating risks and continue to raise privacy concerns, highlighting the need for more balanced and trust-based approaches.
- iv. Psychosocial impact: efforts to enhance engagement and support services could not sufficiently address student isolation and motivation, lacking deeper interventions such as mentorship programmes or peer-network initiatives.
- v. Training scalability: technical training for stakeholders have not accounted for varying skills levels, with insufficient customisation and scalability to meet diverse needs.
- vi. Learning outcomes: there has been no evaluation of whether online assessments effectively maintain or improve educational quality compared to traditional methods.

- **Challenges**

During the pandemic, the university addressed such issues as unstable internet connections and limited access to technology in remote areas by implementing measures like testing systems to handle large numbers of students, improving server performance, and utilising cloud technology. The university used monitoring tools such as webcam surveillance, keystroke tracking, screen-sharing, and anti-cheating software to ensure fairness. Academic integrity policies were strictly enforced with clear descriptions of appropriate behaviour during exams; these expectations were then communicated to the students. Additionally, live proctoring was implemented, with one proctor overseeing 50 students via webcam monitoring. The university also provided technical training and support for both students and staff to ensure the smooth operation of online exams.

Clear communication about online exam procedures helped reduce confusion and build student confidence. However, maintaining motivation and engagement in distance learning remains a challenge. The university organised virtual activities, such as online seminars, workshops, and group activities via online platforms, to promote student engagement. The development of online resources and support services, such as tutoring and counselling, helped students prepare for exams more effectively, ultimately enhancing the efficiency of the online examination system.

- **Lessons Learnt**

From the university's transition to online education and assessments during the pandemic, the following five lessons emerged:

- i. Investing in technology and infrastructure is crucial for the university to adapt to digital education, but these efforts must be accompanied by long-term strategies for sustainability. Simply implementing tools without plans for maintenance, upgrades, and training limits their effectiveness over time.
- ii. Addressing technological inequalities requires more than generalised measures. Targeted interventions, such as subsidised devices and improved internet access for disadvantaged students, are essential to ensure equitable participation.
- iii. While anti-cheating tools can mitigate integrity issues, fostering a culture of academic honesty is equally critical. Over-reliance on technology without integrating ethical education and trust-based policies is insufficient to eliminate the risk of cheating and other dishonest conduct.
- iv. The psychosocial aspects of distance learning demand deeper attention, as students' isolation and lack of motivation hinder engagement and performance.
- v. Providing technical support and training is vital, but scalability and customisation are necessary to effectively meet the diverse needs of students and staff.

## 4.2. Discussion

### 4.2.1. Adaptation and Flexibility in Learning

Learning assessment is a crucial part of the instructional process (Brown & Knight, 1994). Before the pandemic, STOU held exams at standardised provincial exam centres to ensure its students' achievements of learning outcomes. With its expertise in distance education, STOU was less impacted by the pandemic than other conventional universities and quickly adapted to online teaching and assessment, which promoted educational flexibility and effective digital learning (Charytanowicz et al., 2024). Although teaching and assessment methods changed, stakeholders continued to trust the quality of education provided by the university (Charytanowicz et al., 2024).

Online learning assessments demonstrated how students were able to adapt to new learning environments while enjoying greater flexibility and convenience. One student noted, "Taking exams online allowed me to better manage my time, I did not have to travel to a test centre. It was more comfortable to take the test in my own environment." This feedback highlights the positive aspects of remote assessments, aligning with the university's goal to enhance educational flexibility. This confirms Findings 4.1.1, which indicate that the transition to online assessments promoted educational flexibility while maintaining learning outcomes.

For lecturers, online assessments offer an opportunity to explore innovative teaching methods that emphasise higher-order thinking skills. One lecturer shared, “The transition to online assessments encouraged me to explore diverse question types that assess higher-order thinking skills, which I found more effective than traditional multiple-choice exams.” This perspective underscores the instructional benefits of online assessments, including fostering critical thinking and enhancing students’ analytical skills. This aligns with Findings 4.1.1, which reported that online assessments helped lecturers identify the effectiveness of teaching methods and make necessary adjustments to enhance achievement of learning outcomes.

#### ***4.2.2. Trust in Educational Quality and Assessment Credibility***

Despite the changes in teaching and assessment methods, stakeholders continued to trust the quality of graduate produced by the university (Charytanowicz et al., 2024). Employers were confident that STOU graduates possessed the skills and knowledge required by the labour market. Administrators effectively utilised assessment results to allocate resources, improve curricula, and strategically plan for future uncertainties (Sandvik et al., 2023). This continued trust reflects the credibility and quality of education at STOU, despite the shift to online assessments.

#### ***4.2.3. Academic Integrity and Psychological Impact***

The transition to online assessments introduced challenges in maintaining academic integrity and preventing misconduct (Almossa & Alzahrani, 2022). To address these issues, this study proposes guidelines such as establishing clear academic integrity policies and using randomised questions to ensure students receive exam questions in individually different sequences. This approach reduces the likelihood of cheating and makes it more difficult to share answers during exams (Sabrina et al., 2022).

Although proctoring tools can effectively maintain academic integrity, they also cause psychological distress among students, leading to increased anxiety. One student expressed, “I felt more anxious than in traditional exams because I was constantly aware of the camera recording my every movement. It was difficult to focus on the questions.” This sentiment reflects the psychological impact of surveillance technologies, highlighting the need for a balanced approach that ensures academic integrity without compromising students’ well-being. Proctors also faced challenges in balancing strict monitoring with creating a supportive environment to help students perform their best.

#### ***4.2.4. Designing Effective Assessments and Preventing Cheating***

This study emphasises the importance of designing assessments that measure higher-order thinking skills while preventing cheating. It recommends using open-ended questions to promote critical thinking and reduce the risk of academic dishonesty (Bearman et al., 2022). Furthermore, the study suggests reducing the weight of final exam scores and increasing the proportion of grades on learning activities or projects that reflect course learning outcomes. This approach aligns with Mate and Weidenhofer (2021), who argue that diverse assessment methods, such as essays, case studies, discussion forums, and e-portfolios, are more suitable for online environments.

#### ***4.2.5. Technical Challenges and the Role of Digital Infrastructure***

The transition to online learning and assessments require robust and reliable digital infrastructure. STOU demonstrated its adaptability by utilising platforms like Moodle and enhancing server stability to accommodate a greater number of students. However, frequent server issues raised significant concerns among students. One student shared, “The constant fear of losing connection during the exam was stressful. I kept worrying that my answers would not be submitted correctly.” This feedback illustrates the anxiety caused by technical uncertainties, emphasising the need for reliable digital infrastructure to ensure a fair and supportive learning environment.

Information technology (IT) staff played a pivotal role in this change. One IT staff member explained, “Ensuring system stability and addressing technical issues in real-time were our top priorities. We also had

to train faculty members on how to use the online exam platforms effectively.” This insight highlights the behind-the-scenes efforts of IT staff in maintaining system reliability and supporting faculty in adapting to new technologies.

This study illustrates the multifaceted impact of online assessment. For students, online exams enhanced flexibility and convenience while also introducing psychological challenges. For lecturers, they provided opportunities for innovative teaching methods that possibly promote higher-order thinking. Stakeholders continued to trust in educational quality, and administrators effectively used assessment data for strategic planning.

However, challenges in maintaining academic integrity and technological issues were significant, emphasising the need for balanced monitoring methods and reliable digital infrastructure. These align with Findings 4.1.1, which highlight educational flexibility and instructional benefits, and Findings 4.1.4, which discuss technological challenges and digital equity. Overall, this change reflects STOU's adaptability and commitment to maintaining educational quality while enhancing learning flexibility.

## 5. Recommendations and Future Research

### 5.1. Recommendations

#### i. **Enhancing digital infrastructure**

To improve the effectiveness of student assessment, the university should invest in high-quality servers and cloud-based systems capable of supporting a large number of users taking exams simultaneously. Regular system checks and maintenance are crucial to maintain reliability. Furthermore, strengthening cybersecurity measures is essential to protect data from potential breaches. A dedicated technical support team should be readily available during exams to address any technical issue that may arise. Additionally, the university should collaborate with internet service providers to offer affordable internet plans, particularly benefiting those in remote areas.

#### ii. **Increasing comfort with online platforms and promoting academic integrity**

The university should implement comprehensive training sessions to enhance familiarity and confidence with online learning and testing platforms. These programmes should focus on the safe and effective use of digital tools. It is recommended that sessions be provided to new users, with regular updates to keep pace with technological advancements.

Concurrently, promoting academic integrity is vital. The university should educate students on ethical behaviour during exams and compel them to adhere to academic honesty guidelines. Emphasising the importance of academic integrity within classroom discussions will help students understand its significance.

#### iii. **Supporting students' mental health**

Supporting students' mental health during online assessments is crucial for their well-being and academic success. The university should offer counselling services and stress management programmes to alleviate their anxiety. Practice exams can help students familiarize themselves with the online exam environment, and boost self-confidence. Providing clear information about exam procedures and requirements will reduce uncertainty and anxiety related to online exams.

#### iv. **Utilising feedback for continuous improvement**

To enhance the online assessment process, the university should collect feedback from students and analyse their comments to obtain insights into their experiences and identify areas for improvement. Leveraging technology to provide feedback on performance enables students to learn from mistakes and improve future assessments. Teachers should be trained on utilising feedback to refine their teaching methods and assessment practices.

- v. **Ensuring student privacy and data security**  
Protecting student privacy is essential in online assessments. The university must establish transparent guidelines for the collection, storage, and usage of student data. Students should be informed about how their personal information is managed. During exams, monitoring mechanisms should balance cheating prevention with the protection of student privacy.
- vi. **Aligning policies with national and international standards**  
The university should collaborate with educational authorities to ensure that its online assessment policies comply with national standards. Comparing its practices with those of international institutions can help the university identify innovative approaches for improvement. Regular policy reviews are necessary to ensure the university's policies align with evolving educational standards and technological advancements.
- vii. **Enhancing reliability, fairness, and student-centred approaches**  
Implementing these recommendations will make online assessments more reliable, fair, and student-focused. These changes will enable the university to maintain high educational standards while fostering student success in a digital environment. By prioritising digital infrastructure, promoting academic integrity, supporting mental health, safeguarding privacy, and aligning with global standards, the university can enhance the effectiveness of its online assessment system.

## 5.2. Future Research

- i. This study offers valuable insights into the transition to online assessments at STOU during the pandemic. It highlights the institution's adaptability and resilience. Using an MMR approach, the study combined qualitative data from interviews and focus groups with quantitative survey data. This approach effectively captured stakeholder perceptions within STOU's unique educational context. However, the research was conducted exclusively at STOU, focusing on the immediate impact and experiences of online assessments within this specific environment. Therefore, the findings may not be generalisable to other educational institutions with different contexts, structures, and resources. Future research involving other institutions within similar contexts is thus encouraged.
- ii. This study used purposive and convenience sampling, which may limit the generalisability of the findings due to potential sampling bias and a lack of diversity in terms of regions, academic disciplines, and socio-economic backgrounds. The sample may not fully represent the experiences of all students in different contexts. Future research could improve generalisability by using rigorous sampling techniques that involve more diverse student demographics across different faculties, academic programmes, and socio-economic backgrounds within STOU. Expanding the study to other educational institutions would also provide comparative data to better understand how contextual factors influence online assessment practices.
- iii. The statistical analysis design used in this study was primarily descriptive. It effectively identified key trends and patterns in stakeholder perceptions. However, advanced statistical analysis techniques could provide a deeper understanding of the complexity of online assessment experiences. Future research could use multivariate methods, such as structural equation modelling (SEM), hierarchical linear modelling (HLM), or path analysis, to explore causal relationships between variables. These techniques would allow researchers to examine the interactions between factors such as student engagement, academic integrity, and technological challenges. Latent variable modelling could also enhance the accuracy of measurement constructs, such as those addressing student anxiety and satisfaction. Sophisticated statistical analysis techniques in future research can help improve the validity, reliability, and generalisability of the findings.

## 6. Conclusion

The transition to online assessments in Thailand's distance education environment during the pandemic highlights critical insights into adapting evaluation systems amidst unprecedented challenges. Before the pandemic, STOU employed a robust assessment system that relied on paper-based exams conducted at designated provincial centres with strict regulations and standardised grading. However, during the pandemic, STOU transitioned to online exams, implementing new policies to maintain fairness and academic integrity, including identity verification, live proctoring, and adjustments to ensure equitable access for students facing technological challenges. As well, throughout the pandemic, STOU adapted its learning assessments to ensure fairness and quality. Final exams shifted from physical centres to online platforms, supported by strict regulations, identity verification, and live proctoring to maintain integrity. Assessment tools were modified for online use while rigorous quality controls were preserved. Preparatory processes transitioned from physical coordination to virtual setups, addressing technical challenges through enhanced networks and training. Supervision shifted to online proctoring, combining live monitoring with established standards, while grading processes upheld consistency by integrating results from both physical and online exams, ensuring fairness and maintaining academic standards. During the pandemic, learning assessment guidelines emphasised two key areas. First, online exam administration incorporated strategies such as enforcing academic integrity policies, using shuffled options, designing higher-order thinking test items, addressing technological inequalities through partnerships, providing training on using the relevant systems, establishing consultation centres, and developing stable, secure systems with community support. Second, online student assessments included project-based tasks to evaluate critical thinking, problem-solving, and communication skills; self-reflection through portfolios and written evaluations to enhance self-awareness; and peer assessments to foster collaboration, teamwork, and diverse perspectives. The transition to distance learning during the pandemic revealed key obstacles, including adapting to new technologies, ensuring reliable online assessments, addressing technological inequalities, maintaining engagement, and providing resources. Gaps included unsustainable technological investments, inadequate digital equity measures, limited anti-cheating efficacy, insufficient psychosocial support, unscalable training, and a lack of outcome evaluations. Despite these challenges, the university improved infrastructure, enforced academic integrity, and provided training. Lessons learnt emphasise the need for sustainable technology, targeted equity measures, enculturation of academic honesty, psychosocial support, and tailored training to effectively balance technology, equity, and student needs.

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