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Assessment Strategies in Online Learning Environments During the COVID-19 Pandemic in Oman

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Assessment Strategies in Online Learning Environments During the COVID-19 Pandemic in Oman

Abstract

The shift to successful online learning requires online assessment strategies that could facilitate the learning and teaching process and determine the achievement of learning outcomes. This study examined how students' achievement was assessed in an online learning environment during the COVID-19 pandemic and how the College of Education (COE) responded to the shift to online assessment strategies. A mixed-method design using questionnaires and interviews was conducted to collect data from academic staff at COE at Sultan Qaboos University. The study sample consisted of (n=60) academic staff who agreed to answer the research questionnaire. Moreover, the researchers interviewed four academic staff who were experts in online assessment and teachers of practical courses. The interview data were analysed and corroborated with evidence from documents issued by the COE and SQU. The study's findings showed that the academic staff applied various online assessment strategies to measure the learners' achievement. The most applied online assessment strategies were individual projects, presentations, online discussions, and written assignments. The study also found that the COE took measures to enhance its online assessment procedures, including developing an online assessment policy, providing professional development programs, workshops and webinars, and encouraging its staff to conduct further studies to improve online learning practices. Based on the findings, the study suggested some educational implications and recommendations.

Practitioner Notes

1. The study recommends that comprehensive needs and learners' analyses be conducted before a semester begins. Hence, the input data from this analysis should be carefully considered when designing and implementing online assessment strategies.
2. A new policy for the online context is required to maintain the best advantages of online assessment strategies. Community of Practice can work collaboratively to apply and evaluate the new set of policies and guidelines and to prepare clear rules, rubrics and standards to optimise the quality of social assessment strategies
3. This article suggests that academic staff apply alternative assessment strategies that allow the academic staff to observe students applying skills in real-life situations.
4. Practitioners should implement various assessment strategies to offer students flexible opportunities to demonstrate their development, enhance academic integrity, and prevent academic misconduct.
5. The measures and practices that College of Education put in place, including developing an online assessment policy, providing PD programs, conducting workshops and webinars and encouraging further research, are hoped to be embraced as a part of continuous improvements and professional developments to handle future emergency risks and to continue delivering sustainable education.

Keywords

Oman, online assessment, strategies, COVID-19

Introduction

Education institutions experienced sudden and unexpected challenges due to the COVID-19 pandemic. Oman has been an affected country that took the required precautions to save human health and lives. As a part of these precautions, all face-to-face educational activities were suspended, and all learning activities were rapidly switched to online mode. This sudden transfer was challenging for all educational parties, involving stakeholders, tutors, students, and other related positions (Al-Balushi et al., 2022). As a result of the shift towards online learning, new strategies were required to be implemented in the entire education process, from content delivery to assessment strategies.

The rapid transition to online learning mode, including assessment strategies, had some drawbacks. Petillion and McNeil (2020) found that students' motivation was negatively affected due to online shifting, and they experienced high stress and anxiety levels, recommending the significance of reconsidering assessment methods to reduce the difficulties faced. Likewise, although Crick et al. (2020) found that computer science students held significant positive attitudes towards online learning during the COVID-19 pandemic, the shift to online assessment could raise generalisable issues regarding the impact on workload, effective pedagogy, and the examination system. Similarly, one of the most debatable issues in Oman was the online assessment strategies, especially for practical experiences (Osman, 2020), which could directly impact the quality of instruction (Bensaid & Brahimi, 2020). Moreover, non-proper assessment procedures could reduce students' motivation and increase course dropouts (Hussain et al., 2018).

Assessment is essential for the success of any learning process (Cumming et al., 2019); however, research has shown that online assessment has some drawbacks (Bensaid & Brahimi, 2020; Essa et al., 2020; Guangul et al., 2020; Khan & Jawaid, 2020; Osman, 2020; Slimi, 2020). Valid assessment tools significantly contribute to evaluating learning quality and influencing students' satisfaction with online learning (Rodríguez et al., 2019). Therefore, the importance of applying effective online assessment strategies and the significant influence that online assessment could have on the whole learning process have led to the need to further investigate the issue of online assessment in the Omani context. Sultan Qaboos University (SQU) rapidly switched all educational activities to online learning and assessments from the onset of COVID-19. This study examined the online assessment strategies the academic staff utilised during the COVID-19 pandemic at the College of Education (COE) at SQU and explored the measures the COE took to handle the impact of such a shift.

Literature Review

Along with the development of online learning, the assessment process has also grown. Elliott (2008) tracked the shift of assessment starting from

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“assessment 1.0” to “assessment 1.5” and reaching “assessment 2.0”. By assessment 1.0, the author intended to point to the conventional paper-based assessments when time-place constrained while using computers to measure intellectual and physical aspects through e-tests or e-portfolios is considered assessment 1.5. Elliot claimed that assessment 2.0, an online assessment, is a modernised assessment incorporating Information and Communication Technologies (ICT) to meet the 21st-century generation’s needs. According to Pezzino (2018), online assessment is becoming a popular educational tool that provides immediate feedback and promotes learners’ construction of knowledge through multiple practices. In other words, students make mistakes, get immediate feedback, reflect on their answers and build new experiences. Bennett (2018) believed that online assessment is effective and efficient because it quickens achievement measurement, feedback processes, and data collection and analysis. He pointed out that new competencies like IT competencies can be precisely assessed online, adapting and individualising new contexts, taking full advantage of complex experiences, and demonstrating effective reporting skills. Thus, online assessments could have unique strengths over conventional assessments.

Batool et al. (2018) explored the impact of online assessment on undergraduate students’ perceptions in Pakistan. Surveys were collected from 208 students at a medical college. About 60% of the participants were convenient answering questions from the screen. Moreover, 46% of students perceived online assessment as easier than paper-based. Interestingly, only 13% preferred online assessment over paper-based when answering multiple choice and short answer questions. Thus, although students were pleased with this new online assessment, they weren’t prepared for the rapid change and the loss of the paper-based evaluation method. Online assessment is never about forcing technology into the educational process. It should be scientifically based on the requirements of the course objectives and context and learners’ needs and readiness. Thus, assessment functions as a chain between teaching and learning in any learning environment, translating what is truly gained from the intended outcomes and knowing the extent of students’ abilities (Nasab, 2015; Putri et al., 2019).

Traditional Assessment Strategies

Traditional assessment strategies mainly concentrate on measuring cognitive abilities and short-term influence learning (Çalışkan & Kaşıkçı, 2010). Koh (2017) described these strategies as “closed-ended item formats” (p. 4). These strategies intend to tackle lower-order thinking skills. Some examples of these strategies are multiple-choice, true-false, short-answer, matching questions and essays. The literature presented several advantages and disadvantages for this category. Rovai (2000) claimed that traditional assessment strategies are reliable due to their standardised administration procedures, suggesting using them to measure memorisation and comprehension. Nasab (2015) also pointed out other strengths, such as fast administration and quick scoring, emphasising the objectivity of traditional assessment grading. Çalışkan and Kaşıkçı (2010) added that teachers’ familiarity with designing, implementing and evaluating processes is an advantage of the traditional assessment strategies. Therefore, the traditional strategies got these strengths due to their historical popularity, ease of development, global implementation at HEIs and the assumption of their success in assessing learners’ achievement. However, Quansah (2018) criticised the traditional assessment strategies because such strategies narrow down learners’ thinking abilities, offer guessing chances and

stick learning outcomes to what can be performed at a single-occasion test. This criticism raises questions about the effectiveness of these strategies in measuring different levels of learning objectives based on levels of Bloom's (1956) Taxonomy.

Bloom's Taxonomy offers a hierarchical framework for creating and categorising learning objectives and evaluations based on six levels of intellectual activity: knowledge, comprehension, application, analysis, synthesis, and evaluation (Mate & Weidenhofer, 2022). Therefore, traditional assessment strategies depending on closed-ended item formats alone tend to address lower-level learning objectives of Bloom's Taxonomy (knowledge and comprehension) (Çalışkan & Kaşıkçı, 2010). One major reason why teachers set questions from the lower level of the cognitive domain (knowledge and comprehension) than the higher level is that it is simpler to grade and establish a marking scheme (Akinboboye & Ayanwale, 2021). Learners are only required to recognise, recall, and understand facts. Hence, with careful attention to Bloom's Taxonomy, an appropriate balance of online alternative assessment strategies that address lower, intermediate, and higher-order cognitive levels can be used to assess and demonstrate learners' knowledge, proficiencies, and achievements (Tuah & Naing, 2021).

Alternative Assessment Strategies

Alternative assessment is considered more authentic, addressing all curriculum objectives, establishing a connection between teaching and learning, and empowering learners to be independent and aware of their learning processes (Putri et al., 2019; Reardon, 2017; Reeves, 2000). Alternative assessments include strategies that are different from the conventional "pencil-and-paper tests", such as projects, portfolios, presentations, role plays, self-assessment, peer assessment, observations, reflections, projects, fact sheets and journal writing (Dikli, 2003; Putri et al., 2019). Alternative assessment strategies overcome the shortages of traditional assessment strategies. They exceed the acquisition of intellectual skills to thrust learners to transfer their learning to real-life situations (Devran & Elçi, 2020). Nasab (2015) claimed that alternative assessment strategies could build learners' higher-order thinking skills. According to Sagala and Andriani (2019), the ability to analyse, evaluate, and create in Bloom's taxonomy forms higher-order thinking skills. Nasab also believed that alternative assessment could help learners explore their potential and engage them in life-long learning experiences, impacting their creativity and motivation and empowering them to overcome real-world difficulties. Al-Mahrooqi and Denman (2018) claimed that alternative assessment strategies could respond to diverse intelligence and learning styles, creating an iterative interaction between instruction and assessment to support educators and drawing a comprehensive picture of learners' development. Furthermore, the administration and timings of the assessment activities promote high flexibility levels, reduce assessment stress and accurately measure learners' achievement. Koh (2017) summarised the skills gained when implementing alternative assessment strategies,

students are expected to be able to find, organise, interpret, analyse, evaluate, synthesise, and apply new information or knowledge to solve non-routine problems. Students' mastery of the essential 21st-century competencies will enable them to succeed in colleges, to thrive in a fast-changing global economy, and to live meaningfully in a complex, technological connected world. (p. 3)

Thus, alternative assessment strategies could reshape the whole instructional process. They draw educators' attention to target higher-order thinking skills (Koh, 2017; Nasab, 2015) and enhance 21st-century skills such as communicating, solving problems collaboratively, and thinking critically (Conrad & Openo, 2018). They could improve the achievability of the learning objectives by individualising the education context to learners' needs, intelligence and learning styles, offering learners opportunities to express their talents and consequently build their self-confidence. They keep learners' concentration on the learning objectives and continuously assess their progress towards achieving them (Conrad & Openo, 2018; Reardon, 2017). Reeves (2000) encouraged educators to apply alternative assessment strategies when classes run over an online environment. However, Devran and Elçi (2020) reported some limitations of alternative assessment strategies, such as the high level of grading subjectivity compared to traditional strategies, requiring extra time and effort, high costs, and the demand for many facilities and equipment.

The Most Applied Assessment Strategies in Online Learning Environments

Several studies examined the most applied assessment strategies in online learning contexts. Tuah and Naing (2021) performed a scoping literature review to explore the online assessment strategies used in higher education before and during the COVID-19 pandemic. The study findings revealed that HEIs worldwide applied the following online assessment strategies: short quizzes, time-constrained exams, written assignments, online discussions, group work, peer assessment and e-portfolios. In addition, Dietrich et al. (2020) explored the academic staff implementation of online assessment strategies during the COVID-19 pandemic in France. The authors found that the applied strategies were group projects, short quizzes and time-constrained exams. Guangul et al. (2020) also studied the online assessment strategies during the COVID-19 pandemic at an Omani HEI. The results revealed that teachers implemented quizzes, proctored exams, open-book exams, projects, written assignments, presentations, annotated bibliographies, fact sheets and e-portfolios. Kearns (2012) investigated the applied online assessment strategies and labelled six applied assessment strategies: written assignments, online discussions, fieldwork, quizzes, exams and presentations. Moreover, Gaytan and McEwen (2007) found that written assignments, self-assessments, e-portfolios, projects and simulations were the most used assessment strategies in online learning environments in the United States.

Different assessment strategies can be utilised to measure the learning outcomes of an online environment. Traditional assessment strategies could only assess the lower level of Bloom's taxonomy (DeMara et al., 2019), while alternative assessment strategies could enhance and assess different levels of learning (Koh, 2017; Nasab, 2015; Tuah & Naing, 2021). Both traditional and alternative assessment strategies could be applied in online contexts. However, the findings of the discussed studies presented a very narrow range of assessment strategies. Therefore, the applicability of other strategies in online contexts is still questionable. The trend of online learning and online assessment is growing rapidly, and the practices of Sultan Qaboos University (SQU) academic staff towards online assessment are also changing rapidly. Thus, this study attempted to answer the following research questions:

1. What assessment strategies did academic staff apply to measure students' achievement in an online learning environment at the College of Education during the COVID-19 pandemic?
2. How did the College of Education respond to the rapid shift to online assessment strategies during the pandemic?

Method

Context

The study was conducted in the College of Education (COE) at Sultan Qaboos University (SQU) in Oman. At the time of the study, the number of COVID-19 cases was relatively increasing in the province; as a result, social distancing rules came into effect across the country, necessitating the suspension of all face-to-face classroom teaching. However, due to uncertainty in returning to the normal state, online learning was seen to be a feasible solution to continue engaging the students in their studies. In fact, even though the university had created its learning management system (LMS) before the crisis, a change to online learning that was so extensive and sudden was not anticipated. The online assessment was obviously relatively novel in this setting. To use the LMS platform and Moodle for the new online teaching, which included online assessment as a crucial component, the university gave various colleges, including the College of Education, instructional videos and technical support. Therefore, upon the university's decision to stop all face-to-face instruction, the COE switched entirely to online mode. The academic staff had to implement various online assessment strategies to assess students and evaluate the achievement of the learning objectives.

Data Collection and Analysis

A mixed-method research design, including questionnaires and semi-structured interviews, was adopted to investigate the assessment strategies applied by the academic staff and to explore how the COE responded to the rapid switch to online assessment strategies. The research instruments were designed based on the relevant literature (Conrad & Openo, 2018; Dietrich et al., 2020; Guangul et al., 2020; Uddin et al., 2016). Nine experts in educational assessment and online learning evaluated and validated the research instruments. The questionnaire was test-piloted on 30 participants to examine its reliability. According to the results, the Cronbach alpha showed that the questionnaire reached a good level of internal consistency at about ($\alpha = 0.88$). The mixed-method design helped the researchers to quantitatively collect data on the most applied assessment strategies during the pandemic. Furthermore, the semi-structured interviews offered justifications for the academic staff's tendency to concentrate on a set of strategies over others and clarifications of the change process in adopting alternative assessment methods at the college.

The study's population covered all COE academic staff in the academic year 2020-2021. There were about 113 academic staff at eight different departments: Art Education, Curriculum and Instruction, Early Childhood Education, Educational Foundation and Administration, Instructional and Learning Technologies, Islamic Education, Physical Education and Psychology. After getting the approval from the advisor's office for the academic affairs for data collection, the researcher coordinated with the COE dean's office to send an e-mail to all academic staff.

Participation was voluntary, and 60 staff agreed to complete the questionnaires. Moreover, the researchers sent eight interview invitations but received participation agreements only from four academic staff. They were purposively selected: two participants were experts in online assessment, while the other two were teachers of practical courses.

Besides the semi-structured interviews and questionnaire data, the researchers also collected documents issued by COE and SQU during the COVID-19 pandemic to corroborate the collected data with evidence. The qualitative data was analysed from 16 documents released between April 2020 and December 2021 from the Psychology Department, the Center for Educational Technology (CET) and the Center for Excellence in Teaching and Learning (CETL). These documents were policies, announcements, and presentation notes, showing the efforts towards the online assessment change process. The data collected from the interviews and documents were analysed using thematic analysis to report patterns and themes (Braun & Clarke, 2006). The data gathered from the documents was not considered the whole truth or solid proof. However, each piece of information from each document was analysed and interpreted in light of Oman's COVID-19 context, the origin of the document, and the interview data to determine the authenticity and accuracy of each document (Merriam & Tisdell, 2015). The data from the documents were needed to support the interview data to track changes, developments, and improvements.

Results

Data collected from the questionnaire, semi-structured interviews, and documents were analysed and interpreted to answer the research questions.

Applied Assessment Strategies

The questionnaire comprised 19 applied assessment strategies constructed on a five-point Likert scale system, always = 5, Often = 4, Sometimes = 3, Rarely = 2 and Never = 1. The SPSS software (version 25) was utilised to code and analyse the questionnaire data. Table 1 presents the calculated values and their interpretations (Pimentel, 2019).

Table 1
Scale Values of the Means and their Interpretations

| Scale Value | Interpretation |
|-------------|-------------------|
| 4.20 – 5.0 | Always Applied |
| 3.40 – 4.19 | Often Applied |
| 2.60 – 3.39 | Sometimes Applied |
| 1.80 – 2.59 | Rarely Applied |
| 1 – 1.79 | Never Applied |

The mean and standard deviation were measured for each assessment strategy, and the applied online assessment strategies were placed according to their means into their representative scale in Table 1, ranking them from the most to the least applied strategies. Table 2 presents the means and standard deviations for all applied assessment strategies ranked from the most to the least applied ones, as reported by a sample of 60 academic staff from the eight departments at the COE.

Table 2

Descriptive Statistics for the Applied Assessment Strategies at COE (N = 60)

| Rank | Strategy | <i>M</i> | <i>SD</i> | Interpretation |
|------|-----------------------------------|----------|-----------|-------------------|
| 1 | Individual Projects | 4.53 | 0.81 | Always Applied |
| 2 | Presentations | 4.47 | 0.90 | |
| 3 | Online Discussions | 4.22 | 1.05 | Often Applied |
| 4 | Written Assignments | 4.22 | 1.13 | |
| 5 | Group Work | 3.80 | 1.17 | |
| 6 | Research proposals | 3.76 | 1.17 | |
| 7 | Time-constrained exams | 3.64 | 1.39 | |
| 8 | open-book exams | 3.40 | 1.37 | Sometimes Applied |
| 9 | short-quizzes | 3.34 | 1.27 | |
| 10 | e-portfolio | 3.29 | 1.59 | |
| 11 | Reflections | 3.29 | 1.53 | |
| 12 | Self-assessment | 2.93 | 1.46 | |
| 13 | Writing of thesis/dissertation | 2.84 | 1.57 | |
| 14 | Oral-exams | 2.73 | 1.37 | |
| 15 | Peer-assessment | 2.59 | 1.37 | Rarely Applied |
| 16 | Fieldwork | 2.56 | 1.45 | |
| 17 | Journals Writing | 2.39 | 1.40 | |
| 18 | Writing of Annotated Bibliography | 2.18 | 1.31 | |
| 19 | Writing of Fact Sheet | 2.09 | 1.20 | |

As shown in Table 2, the academic staff at COE always apply individual projects and presentations with ($M = 4.53$, $SD = 0.81$) and ($M = 4.47$, $SD = 0.90$), respectively. Furthermore, the other five assessment strategies, online discussion, written assignments, group work, research proposal and time-constrained exams, were often applied to measuring students' achievements. The academic staff sometimes applied the following strategies: open-book exams, short quizzes, e-portfolios, reflections, self-assessment, writing of thesis/dissertation and oral exams. Finally, the results reported that some assessment strategies were rarely applied, with a mean of less than ($M < 2.60$), including peer assessment, fieldwork, journal writing, writing of annotated bibliography, and writing of fact sheet. According to the responses, the academic staff selected none of the listed strategies as 'never applied'. In addition, thematic analysis was administered to analyse the semi-structured interviews to explore the reasons towards applying particular online assessment strategies. The reasons influencing academic staff application of online assessment strategies were analysed into codes and themes, as displayed in Table 3.

Table 3*Reasons for the Application of Online Assessment Strategies at COE (N = 4)*

| Themes | Codes |
|---|---|
| Reasons for most frequently applied assessment strategies | Suit learning objectives Suit COVID-19 situation: <ul style="list-style-type: none"> - Offer a social atmosphere - Overcome the absence of physical attendance Variability |
| Reasons for less frequently applied assessment strategies | Difficult to design <ul style="list-style-type: none"> - Time constraints - Setting clear assessment criteria Learners' lack of writing abilities Plagiarism Tackle higher-order thinking skills, like: <ul style="list-style-type: none"> - e-portfolios - peer-assessment |

Table 3 findings claim that the academic staff tended to frequently apply certain assessment strategies because these strategies were best suited to measuring the intended learning objectives, as explained by one respondent, "Individual projects, e-portfolios, reflections, online discussions and research proposals... all helped me to achieve my learning objectives and suit the learning situation (ERT) during COVID-19 pandemic". In addition, they were appropriate for COVID-19 pandemic issues as they offered a social atmosphere for learners and supported overcoming the absence of physical attendance to classes, labs, and workshops. Another respondent commented, "To manage the absence of face-to-face attendance at schools, students were asked to videotape their demonstration of teaching practice with some family members at home along with submitting the lessons' plans." One respondent elaborated, "...because I am already separated from my students. I used discussion forums to provide them a good environment for asking questions and initiating discussions. They helped me to watch their progress". Furthermore, the academic staff used various assessment strategies to increase the chances for students' demonstration of learning. A respondent clarified the nature of some courses "We teach heavily credited courses. The teaching practicum courses weigh nine credit hours. We need to offer students as many chances to demonstrate their skills. Thus, we insist on offering a wide variability of assessment strategies".

In contrast, the academic staff applied some of the online assessment strategies less frequently due to the difficulty of designing these strategies and tools. The required efforts, time, skills, learners' lack of writing abilities, and plagiarism formed the difficulty. Only two interviewees believed in the benefits of applying e-portfolios and peer assessment to promote learners' higher-order thinking skills. An expert in online assessment shared his experience with implementing the e-portfolios strategy,

I used e-portfolios as they helped me measure deep understanding and offered me solid measures of how students think, design, develop, manage to learn and reflect on the

learning objectives they need to achieve... Designing and developing online assessment activities require extra time and effort to measure objectives. It took me three hours to prepare my lecture with embedded online assessment activities.

Furthermore, a practical course teacher expressed some of the benefits of using e-portfolios to track learners' progress "I asked students to develop e-portfolios for documenting all their lesson plans, reflections, presentations, mind-maps, peer-assessments, and research proposals... These strategies could develop various capabilities of our graduates that they need to transfer to the educational field". On the contrary, a respondent claimed that applying e-portfolios as an assessment strategy could require more time and a precise setting of assessment criteria to assess learners' learning process and achievement of the course objectives, "it was hard to prepare e-portfolios assessment criteria and required more time and attention to follow and track learners. E-portfolio utilisation is equally challenging for me without the right guidance and support. I am not proud of my digital skills." Also, another respondent mentioned challenges related to students' experience in creating e-portfolios and workload constraints from other courses. As a result, they might attempt to copy materials from the Internet or share some materials with their colleagues. The respondent explained, "Students needed more time to create e-portfolios. They were busy with other online course requirements. They really required a lot of support, effort, and following-up, which I didn't have time to do."

In addition, it's evident that most rarely applied strategies related to writing skills, such as journal writing, annotated bibliographies, and writing fact sheets. The participants thought these strategies required more time and effort to be marked and might not achieve their course objectives. One of the participants elaborated,

... that we teach several courses which demand effort and time to prepare and design online materials. Asking students to write journals or fact sheets requires time to mark and provide feedback ... I am unsure if they suit the nature of my course and offer valid assessments for my students' achievement.

COE's Shift to Online Assessment Strategies

In order to analyse the data from semi-structured interviews and documents, thematic analysis was administered. Four main themes emerged from the interview data and document analysis using manual thematic analysis, proving that COE implemented measures to enhance online assessment during the COVID-19 pandemic. Table 4 presents the COE's responses to the transition process to online assessment strategies.

Table 4
COE's Responses to the Application of Online Assessment Strategies

| Themes | Codes |
|---|---|
| Development of Online Assessment Policy | Alternative assessment tools for online learning (Manual) SQU E-Learning System Use Procedures Technical Support Help desk |
| Professional Development Programs | On-Campus Training Community of Practice (COP) <ul style="list-style-type: none"> - Apply the Alternative Assessment document - offering feedback - suggesting developments/solutions - Exchanging experiences among different departments at COE, and various colleges at SQU |
| Workshops and Webinars | Agreements with international and local expertise institutions to cooperate in conducting webinars and workshops Conferences about online assessment |
| Research and Development | The college encouraged its academic staff to contribute to research to develop the online assessment. For example: <ul style="list-style-type: none"> - (Al-Balushi et al., 2022) - (Al-Maqbali & Raja Hussain, 2022) - (Osman, 2020) |

Table 4 suggests that the COE conducted various measures and procedures to smooth the transition to online assessment strategies. The college developed an online assessment policy and emphasised the alignment of assessment designs to measure the intended learning outcomes. An example of the change in assessment methods was highlighted in a document by the Department of Psychology. A participant explained:

At COE, we – a team of assessment experts- developed a guide for alternative assessment strategies. This guide could be a reference for us and all academic staff at COE. Although alternative assessment requires a lot of effort and time, the document could reduce the assessment threats encountered ... the document presented a brief overview of alternative assessment tools compatible with online learning.

The college formed a team of faculty members specialising in measurement and assessment based in the psychology department to compile a guide on employing alternative assessment methods compatible with online learning modes. The document served as a guide in the form of an instruction manual titled *Alternative assessment tools for online learning*. The manual outlined alternative assessment strategies such as take-home examinations, e-portfolios, e-discussions, individual/group projects, and self/peer assessment. The document also included

criteria for selecting alternative assessment tools, a step-by-step implementation process, and guidance on handling the challenges that may arise. The manual also offered recommendations on how each assessment strategy should be applied in different specialisations, considering the nature of the course and the backgrounds of the students. The manual also provided information on using Turnitin to check for plagiarism and integrate these strategies with Moodle.

In addition, SQU prepared an SQU e-Learning System Use Procedure document that refers to the guidelines and procedures for using the e-learning system at SQU. The document outlined the steps and requirements for accessing and using the e-learning platform, the roles and responsibilities of students, academic staff, and administrators, and the guidelines on acceptable behaviour and academic integrity when using the e-Learning system. Besides, the COE set up a helpdesk to support students and academic staff throughout the transition process, including assistance with online tools and connectivity problems.

Furthermore, the COE has established various professional development programs for academic staff to provide training and resources to enhance their online assessment capabilities. These programs included training sessions on developing effective online assessment strategies, using learning management systems, managing online grading and feedback, establishing a community of practice at the department level and encouraging peer review processes. The department also solicited feedback from students and academic staff on their experience with online assessments to improve the online learning experience. One respondent articulated,

... Yes, there is much training provided by the department. Each department has developed strategies that suit the nature of its courses and provided training and appropriate resources to apply them ... when a member notices a problem with a strategy ... other members are informed about changing or modifying the strategy. Also, feedback was collected from students continuously.

Besides, the COE regularly conducted workshops and webinars to support and guide academic staff on designing and implementing online assessments, keeping pace with technological developments, and contributing to the advancement of online assessment practices. These webinars and workshops were designed to offer practical tips, new ideas, and best practices that academic staff could implement in their courses. A participant mentioned, "I attended about six webinars for facing these challenges related to assessment design, development, and application." The college also promoted continuous improvement by encouraging its academic staff to contribute to research to develop online assessment practices. Some examples of these studies were Al-Balushi et al. (2022), Al-Maqbali and Raja Hussain (2022), and Osman (2020). A participant explained, "It became a trend to search on issues related to online assessment practices."

Summing up, these pieces of evidence suggest that the College of Education improved its online assessment practices during the COVID-19 pandemic, enabling the college to successfully continue its educational activities and continue providing its students with high-quality academic programs. Hence, the academic community at the college was committed to good assessment design practices by employing online assessment strategies that were valid and reliable and produced meaningful data that could be used to improve student outcomes.

Discussion

The first research question explored the assessment strategies academic staff at COE applied to measure students' achievement in an online learning environment during the COVID-19 pandemic. The study's findings suggested that the academic staff applied various assessment strategies in online learning during COVID-19 to measure learners' achievement, prevent challenges around academic integrity, and enhance learners' autonomy for self-learning. They always applied strategies such as individual projects and presentations, often applied online discussions, written assignments, group work, research proposals and time-constrained exams to measure students' achievements, and rarely applied peer assessment, fieldwork, journal writing, annotated bibliography, and fact sheet writing.

The study findings agreed with Tuah and Naing (2021), who reviewed the online assessment strategies applied by different HEIs worldwide in medical education. Overall, the academic staff of COE used various online assessment strategies to measure students' achievement, as recommended by García-Peñalvo et al. (2021) and Guangul et al. (2020). Such variability opens different learning demonstration channels, enhancing the assessment process's flexibility and achieving the learning goals. Zlatović et al. (2015) assumed that announcing various types of online assessments could achieve more students' learning strategies and positively impact achieving the desired learning goals. In addition, academic staff always applied "individual projects" to encourage learners to become active-knowledge builders, autonomous and goal-directed (Chanpet et al., 2018). Presentation strategy was also found to be always applied, which could help ensure academic integrity (Guangul et al., 2020). Thus, the presentation strategy could build learners' self-confidence and share new learning experiences.

Furthermore, academic staff often applied strategies that socialise learning, like online discussions and group projects. Online discussions can be conducted either synchronously or asynchronously. Dietrich et al. (2020) found that 79.8% of learners believed that learning is useless without social interaction and communication. Social interaction between learners could improve their skills and contribute to the quality of the constructed knowledge (Muhisn et al., 2019). Thus, clear rules, rubrics and standards are required to optimise the quality of social assessment strategies. Such interaction and participation policy should be shared with students at the beginning of the course.

Besides, although time-constrained exams were always applied pre-COVID-19 pandemic (Dietrich et al., 2020; Guangul et al., 2020; Tuah & Naing, 2021; Uddin et al., 2016), they got lesser in popularity and were found to be often applied during the pandemic. The main concern that burdens academic staff with applying time-constrained exams is cheating (Munoz & Mackay, 2019). Kim (2020) listed other issues, such as stress and requirements of networks, hardware and software. Due to these drawbacks, Dietrich et al. (2020) found 60.7% of students preferred cancelling time-constrained exams in online environments in France. Thus, though time-constrained exams were very popular in face-to-face classes, they've become less popular in online learning environments.

Moreover, the current study found that written assignments and research proposals were often applied assessment strategies, while open-book exams and writing of thesis/dissertations were in the list of sometimes applied strategies. One of the advantages of online courses is being

textual. Online courses offer a rich environment that expands students' learning process and provides enormous opportunities to share and display knowledge. Writing-based activities open up learning opportunities for everyone involved (Warnock, 2009). Thus, writing is a powerful tool that opens the door for students to show their knowledge, organisational skills and ability to explore new ideas (Muirhead, 2000). However, academic dishonesty in online courses is a concern, especially in written-based assignments. Incidences of plagiarism in online courses exceed traditional face-to-face courses due to extra time to complete assignments, isolation, and lack of interaction with instructors and peers (Sileo & Sileo, 2008). Therefore, all educators in online classes must adhere to and find strategies to prevent plagiarism in online classes, such as using plagiarism detection software that compare students' papers with Internet materials to detect plagiarism cases (García-Peñalvo et al., 2021). Consequently, learners' awareness of the importance of reducing their plagiarism percentage could increase.

In addition, the current study found that three alternative assessment strategies, e-portfolios, reflections and self-assessment, were among the list of sometimes-applied strategies. Assessing students' e-portfolios could demonstrate how students' learning has progressed and offer a great platform for immediate feedback, reflection, and self-assessment (Walland & Shaw, 2022). The literature suggested that although some students found the process of creating e-portfolios challenging, they believed that the strategy supported the refinement of skills and offered an opportunity for creativity, providing an ongoing record of progress and allowing collaboration with peers and instructors (Dune et al., 2018). However, e-portfolios should be thoroughly assessed, designed and implemented to achieve valid, meaningful, and reliable outcomes (Barrot, 2021). Therefore, institutions need to offer professional development programs to ensure that the assessment criteria used are clearly stated to enhance the reliability of the e-portfolio strategy and other alternative assessment techniques (Meletiadiou, 2021). The effectiveness of e-portfolios depends on the platform's functionality, the assessment design and the training provided to students and faculty.

Besides, the academic staff rarely applied alternative assessment strategies such as peer assessment, journal writing, annotated bibliography, and fact sheet writing. This can be due to academic staff's difficulty designing specific assessment activities for these strategies for online environments. The staff assessment literacy and allocated time and cost could play a significant role in optimising the application level of these strategies (Looney et al., 2018; Walvoord, 2010).

The second research question examined the COE's policies, procedures and professional development to equip academics with the knowledge and resources to switch to online assessment design, development, and application. The study's findings found that the COE implemented several policies and procedures to facilitate the switch to online assessment methods, including developing an online assessment policy, providing professional development programs, conducting workshops and webinars, and encouraging research and development. A literature review revealed that the study findings agreed with various studies, emphasising the significance of professional development for academic staff to cope successfully with online assessment strategies and practices in online teaching modality (Singh et al., 2021). Likewise, Honnurvali et al. (2022) provided recommendations for academics, students, and administrators to make the shift to online education more robust and sustainable, including on-campus and off-campus workshops, continuous professional development programs, funding research in online

education, providing incentives for online instruction and learning, and centres for technical support. Moreover, Sabrina et al. (2022) claimed that academic staff should be able to design and apply various online assessment strategies to enhance academic integrity and prevent academic misconduct through receiving regular training and raising awareness of policies and procedures. Thus, the COE has taken significant steps to optimise online assessment practices among its faculty and students, enhance academic integrity, and prevent academic misconduct in online assessments by applying various assessment strategies and did not rely on a limited number of strategies.

Importantly, the steps, measures, and modifications taken during COVID-19 to optimise online teaching and assessment practices are hoped to be maintained to develop a sustainable education system that can handle any emergency risks in the future (Honnurvali et al., 2022). Khandakar et al. (2022) suggested adopting innovative teaching strategies that guarantee the achievement of learning outcomes using a multi-course project-based learning (MPL) approach, which promotes critical thinking skills and provides high-quality education and sustainable online assessment strategies not just during the pandemic but beyond the crisis. Also, Online teaching and assessment must balance technology demands, learning objectives, delivery strategies and approaches, learning resources, and peer feedback (Sahu et al., 2022). Educational institutions need to conduct regular evaluations of the effectiveness of online alternative assessment strategies and practices, provide continuous training and support, encourage collaboration and sharing of best practices among educators and institutions, invest in technology infrastructure and resources, and continuously monitor and adapt policies and procedures to meet the changing needs of students and academics (Al-Balushi et al., 2022; Bobby & Mohapatra, 2022; Boohene & Maxwell, 2020).

Conclusion

This study investigated the applied assessment strategies in an online learning environment at COE during the COVID-19 pandemic and found that the academic staff used a variety of online assessment strategies to measure students' achievement and improve students' learning competence. The academics found several assessment strategies more effective than others in measuring the intended outcomes and offered a social atmosphere for learners. However, they applied some of the online assessment strategies less frequently due to the difficulty of designing them, as they required effort, time, and skills. Moreover, the study explored how the COE responded to the online assessment shift process and found that the COE significantly modified their policies, practices, training, and community of practice to equip academics with the knowledge to switch to alternative assessment design, development, and implementation. The changes included developing an online assessment policy, offering workshops and training sessions on alternative assessments, creating communities of practice for instructors to share best practices, and providing incentives to conduct further studies to support the implementation of alternative assessments.

In light of the study's findings, this study suggests that academic staff utilise more performance-based or authentic-based assessment strategies to determine the learners' achievement and allow the academic staff to observe students applying skills in real-life situations. The study also recommends that comprehensive need analysis and learners' analysis should be conducted

before a semester begins, and the input data should be carefully considered when designing and implementing online assessment strategies. Such analysis could contribute to enhancing the fairness of the assessment process. The study also advocates that the COE's measures and practices implemented during the COVID-19 pandemic are to be adopted as a part of continuous improvements and professional developments to manage future emergency risks and sustain high-quality education.

As a part of the regular courses' evaluation each semester, a section should be added to collect students' feedback on the suitability of the implemented assessment strategies for the course subject area. Thus, such feedback should be considered to develop the online assessment process and reduce its possible drawbacks. Furthermore, teachers should share with learners a clear plan of the assessment strategies, tasks' weights, submission deadlines and evaluation criteria at the beginning of the semester. Students should get a chance to suggest justifiable developments in the assessment plan. Learners' difficulties should be considered, and alternatives should be prepared for any interruptions during the assessment process. Online assessment strategies directly impact students, so their preferences for the applied strategies should be further studied.

The significance of online assessment in educational contexts is incontestable. The researchers have provided various pieces of evidence to confirm the significance and benefits of online assessment as a significant feature in educational practices. It provides excessive opportunities for collaboration, interaction and communication. Moreover, the flexibility and variety of technology tools offer tremendous opportunities to promote autonomy, improve academic achievement, and develop assessment proficiency. However, successful online assessment practices are influenced by the quality of the utilised online assessment strategies that need to be personalised to suit all learners' needs and the functionality of the nature of online courses. Continuous training and professional development of academics are required to ensure the sustainability of a high-quality delivery of education under any circumstances.

Conflict of Interest

The authors disclose that they have no actual or perceived conflicts of interest. The authors disclose that they have not received any funding for this manuscript beyond resourcing for academic time at their respective university.

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