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Teaching and Learning Continuity Amid and Beyond the Pandemic

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The study explored the challenges and issues in teaching and learning continuity of public higher education in the Philippines as a result of the COVID-19 pandemic. The study employed the exploratory mixed-method triangulation design and analyzed the data gathered from 3, 989 respondents composed of students and faculty members. It was found out that during school lockdowns, the teachers made adjustments in teaching and learning designs guided by the policies implemented by the institution. Most of the students had difficulty complying with the learning activities and requirements due to limited or no internet connectivity. Emerging themes were identified from the qualitative responses to include the trajectory for flexible learning delivery, the role of technology, the teaching and learning environment, and the prioritization of safety and security. Scenario analysis provided the contextual basis for strategic actions amid and beyond the pandemic. To ensure teaching and learning continuity, it is concluded that higher education institutions have to migrate to flexible teaching and learning modality recalibrate the curriculum, capacitate the faculty, upgrade the infrastructure, implement a strategic plan and assess all aspects of the plan.

Keywords: teaching and learning continuity, flexible learning, pandemic, higher education, scenario–analysis

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INTRODUCTION

The COVID-19 pandemic has created unprecedented challenges economically, socially, and politically across the globe. More than just a health crisis, it has resulted in an educational crisis. During lockdowns and quarantines, 87% of the world's student population was affected and 1.52 billion learners were out of school and related educational institutions (UNESCO Learning Portal, 2020). The suddenness, uncertainty, and volatility of COVID-19 left the education system in a rush of addressing the changing learning landscape.

The disruption of COVID-19 in the educational system is of great magnitude that universities have to cope with at the soonest possible time. The call is for higher education institutions to develop a resilient learning system using evidence-based and needs-based information so that responsive and proactive measures can be instituted. Coping with the effects of COVID-19 in higher education institutions demands a variety of perspectives among stakeholders. Consultation needs to include the administration who supports the teaching-learning processes, the students who are the core of the system, the faculty members or teachers who perform various academic roles, parents, and guardians who share the responsibility of learning continuity, the community, and the external partners who contribute to the completion of the educational requirements of the students. These complicated identities show that an institution of higher learning has a large number of stakeholders (Illanes et al., 2020; Smalley, 2020). In the context of the pandemic, universities have to start understanding and identifying medium-term and long-term implications of this phenomenon on teaching, learning,

student experience, infrastructure, operation, and staff. Scenario analysis and understanding of the context of each university are necessary to the current challenges they are confronted with (Frankki et al., 2020). Universities have to be resilient in times of crisis. Resiliency in the educational system is the ability to overcome challenges of all kinds–trauma, tragedy, crises, and bounce back stronger, wiser, and more personally powerful (Henderson, 2012). The educational system must prepare to develop plans to move forward and address the new normal after the crisis. To be resilient, higher education needs to address teaching and learning continuity amid and beyond the pandemic.

Teaching and Learning in Times of Crisis

The teaching and learning process assumes a different shape in times of crisis. When disasters and crises (man-made and natural) occur, schools and colleges need to be resilient and find new ways to continue the teaching–learning activities (Chang-Richards et al., 2013). One emerging reality as a result of the world health crisis is the migration to online learning modalities to mitigate the risk of face-to-face interaction. Universities are forced to migrate from face-to-face delivery to online modality as a result of the pandemic. In the Philippines, most universities including Cebu Normal University have resorted to online learning during school lockdowns. However, this sudden shift has resulted in problems especially for learners without access to technology. When online learning modality is used as a result of the pandemic, the gap between those who have connectivity and those without widened. The continuing academic engagement has been a challenge for teachers and students due to access and internet connectivity.

Considering the limitation on connectivity, the concept of flexible learning emerged as an option for online learning especially in higher institutions in the Philippines. Flexible learning focuses on giving students choice in the pace, place, and mode of students' learning which can be promoted through appropriate pedagogical practice (Gordon, 2014). The learners are provided with the option on how he/she will continue with his/her studies, where and when he/she can proceed, and in what ways can the learners comply with the requirements and show evidences of learning outcomes. Flexible learning and teaching span a multitude of approaches that can meet the varied needs of diverse learners. These include "independence in terms of time and location of learning, and the availability of some degree of choice in the curriculum (including content, learning strategies, and assessment) and the use of contemporary information and communication technologies to support a range of learning strategies" (Alexander, 2010).

One key component in migrating to flexible modality is to consider how flexibility is integrated into the key dimensions of teaching and learning. One major consideration is leveraging flexibility in the curriculum. The curriculum encompasses the recommended, written, taught or implemented, assessed, and learned curriculum (Glatthorn, 2000). Curriculum pertains to the curricular programs, the teaching, and learning design, learning resources as assessment, and teaching and learning environment. Adjustment on the types of assessment measures is a major factor amid the pandemic. There is a need to limit requirements and focus on the major essential projects that measure the enduring learning outcomes like case scenarios, problem-based activities, and capstone projects. Authentic assessments have to be intensified to ensure that competencies are acquired by the learners. In the process of modifying the curriculum amid the pandemic, it must be remembered that initiatives and evaluation tasks must be anchored on what the learners need including their safety and well-being.

Curriculum recalibration is not just about the content of what is to be learned and taught but how it is to be learned, taught, and assessed in the context of the challenges brought about by the pandemic. A flexible curriculum design should be learner-centered; take into account the demographic profile and circumstances of learners–such as access to technology, technological literacies, different learning styles and capabilities, different knowledge backgrounds and experiences - and ensure varied and flexible forms of assessment (Ryan and Tilbury, 2013; Gachago et al., 2018). The challenge during the pandemic is how to create a balance between relevant basic competencies for the students to acquire and the teachers' desire to achieve the intended outcomes of the curriculum.

The learners' engagement in the teaching-learning process needs to be taken into consideration in the context of flexibility. This is about the design and development of productive learning experiences so that each learner is exposed to most of the learning opportunities. Considering that face-to-face modality is not feasible during the pandemic, teachers may consider flexible distant learning options like correspondence teaching, module-based learning, project-based, and television broadcast. For learners with internet connectivity, computer-assisted instruction, synchronous online learning, asynchronous online learning, collaborative e-learning may be considered.

The Role of Technology in Learning Continuity

Technology provides innovative and resilient solutions in times of crisis to combat disruption and helps people to communicate and even work virtually without the need for face-to-face interaction. This leads to many system changes in organizations as they adopt new technology for interacting and working (Mark and Semaan, 2008). However, technological challenges like internet connectivity especially for places without signals can be the greatest obstacle in teaching and learning continuity especially for academic institutions who have opted for online learning as a teaching modality. Thus, the alternative models of learning during the pandemic should be supported by a well-designed technical and logistical implementation plan (Edizon, 2020).

The nationwide closure of educational institutions in an attempt to contain the spread of the virus has impacted 90% of the world's student population (UNESCO, 2020). It is the intent of this study to look into the challenges in teaching and learning continuity amidst the pandemic. The need to mitigate the immediate impact of school closures on the continuity of learning among learners from their perspectives is an important consideration (Edizon, 2020; Hijazi, 2020; UNESCO, 2020). Moreover, the teachers' perspectives are equally as important

as the learners since they are the ones providing and sustaining the learning process. Teachers should effectively approach these current challenges to facilitate learning among learners, learner differentiation, and learner-centeredness and be ready to assume the role of facilitators on the remote learning platforms (Chi-Kin Lee, 2020; Edizon, 2020; Hijazi, 2020).

Statement of Objective

This study explores the issues and challenges in teaching and learning amid the pandemic from the lenses of the faculty members and students of a public university in the Philippines as the basis for the development of strategic actions for teaching and learning continuity. Specifically, this study aimed to:

Objective 1: determine the profile of the learners/students in terms of:
a.1. Preferred flexible learning activities.
a.2. Problems completing Requirements due to ICT Limitation
a.3. Provision of alternative/additional requirement.
a.4. Receipt of learning feedback.
a.5. Learning environment.
Objective 2: determine the profile of faculty and students in terms of online capacity as categorized into:
b.1. Access to Information Technology.
b.2. Access to Internet/Wi-fi.
b.3. Stability of internet connection.
Objective 3: develop emerging themes from the experiences and challenges of teaching and learning amidst the pandemic.

METHODOLOGY

The design used in the study is an exploratory mixed-method triangulation design. It was utilized to obtain different information but complementary data on a common topic or intent of the study, bringing together the differing strengths non-overlapping weaknesses of quantitative methods with those of qualitative methods (Creswell, 2006). The use of the mixed method provided the data used as a basis for the analysis and planning perspective of the study.

This study was conducted in the context of a state university funded by the Philippine government whose location was once identified as having one of the highest COVID19 cases in the country. With this incidence, the sudden suspension of classes and the immediate need to shift the learning platform responsive to the needs of the learners lend a significant consideration in this study. This explored the perspectives of the learners in terms of their current capacity and its implications in the learning continuity using online learning. These were explored based on the availability of gadgets, internet connectivity, and their learning experiences with their teachers. These perspectives were also explored on the part of the teachers as they were the ones who provided learning inputs to the students. These are necessary information to identify strategic actions for the teaching and learning continuity plan of the university.

After getting the quantitative and qualitative findings, these data were reviewed to provide a clear understanding of teachers' and learners' context and their experiences. From this information, a scenario analysis through scenario building was conducted which led to the development of the strategic actions for teaching and learning continuity. Scenario analysis is a method used in predicting the possible occurrences of consequences of a situation assuming the phenomenon will be continued in the future (Kishita et al., 2016). This approach is considered a useful way for exploring plausible events that may or may not happen in the future (Bekessy and Selinske, 2017). This approach was used to analyze the behavior of both teachers and students as part of the whole system in response to an unexpected event such as the pandemic which creates a theoretical scenario of best -case (optimistic) or worse case (pessimistic) scenario to enable the university to develop a holistic strategic plan for the teaching and learning continuity (Balaman, 2019).

Both quantitative and qualitative approaches were used simultaneously. In this study, objectives 1 and 2 require data on the profile of the teachers and learners which can best be acquired using a descriptive quantitative design. This was done through an online structured survey was conducted to identify the challenges in teaching and learning using google forms. Choices were provided in the Google form which the respondents can choose from. The surveys were done by the Cebu Normal University - Center for Research and Development and Federation of Supreme Student Council.

The qualitative approach was utilized to answer objective number 3 which looked into the experiences and challenges of the teachers and the learners. The narratives which the respondents submitted were done through online open-ended questions to allow them to share their experiences and challenges. These were analyzed using a thematic approach to best provide a clear description of the experiences and challenges.

After the analysis of the quantitative and qualitative data, the team of researchers developed the possible scenarios that will take place as the basis for the flexible strategic actions that the university will adapt depending on the classification of community quarantine and the health situation of the locale where the university is located. In the analysis of the current status of Cebu Normal University, parameters are reviewed and outcomes are utilized through scenario building. Scenario building provides the contextual basis for the development of the new normal in the university. Scenario building as explained by Wilkinson (1995) is a good strategy to use on how current observations play their role in future situations. Each scenario is constructed about the future, modeling a distinct, plausible world. Scenarios are plausible alternative futures of what might happen under particular assumptions by focusing on key drivers, complex interactions, and irreducible uncertainties (Polcyznski, 2009).

The prospective scenarios created are the best, probable scenarios, and worse scenarios. Current or existing situations/ conditions of CNU served as the probable scenario, while the ideal case situation served as the best scenario. From the scenario built, key problems and challenges are developed as a basis for the model developed (Imperial, 2020). This provided the strategic long-term and short-term strategies for CNU's academic operations. The best scenario is based on the perspective that the university allows limited face-to-

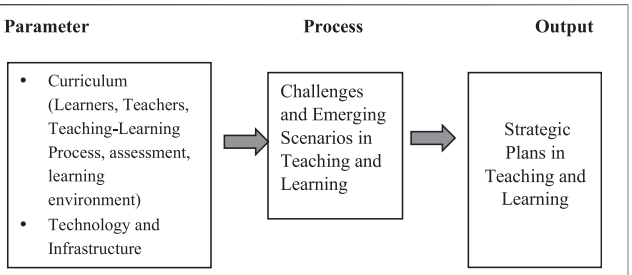

FIGURE 1 | Schematic diagram of the conceptual analysis.

face classes in the remaining months of the semester. The probable scenario is with the current enhanced community quarantine (ECQ) status of the city or province where the university is located, at least six (6) months, after, face-to-face interactions will be allowed with the opening of the new school year will. Worse Scenario happens when the locale is placed under sustained community quarantine and face-to-face classes will never be allowed at the start of the new school year. The strategic actions of the university are inclusive of the three (3) scenarios to allow flexibility of the responses of the university in this pandemic.

There were 3,646 student respondents (85% of the student population) and 252 (97% of the teaching personnel) teaching personnel who responded to the survey. To determine accessibility and reach of communication transmission related to the teaching-learning process, the location of the respondents was also identified. The majority of the student respondents (67%) are located in Cebu province; 17% in Cebu City, and 12% in other provinces. The 63% or 157 faculty members are residing in Cebu province while 32% or 81 of them reside in Cebu City; other provinces 5%. Qualitative feedback was also gathered to explore further the challenges experienced and clarify information about open-ended online messaging. Data was gathered from March-April 2020 in a state-funded university in the Philippines with the campus located in the center of the city. To comply with the ethical guidelines, strict adherence to data privacy protocols and data use restrictions were followed. The data were analyzed and were considered in identifying emerging themes scenarios in teaching and learning.

The data gathered were reviewed and analyzed by looking into the challenges that need to be addressed and the ideal perspectives that should have been implemented to generate different scenarios. Scenario building provides the contextual basis for the development of the new normal in the university. Scenario building as explained by Wilkinson (1995) is a good strategy to use on how current observations play their role in future situations. Each scenario is constructed about the future modeling a distinct, plausible world. Scenarios are plausible alternative futures of what might happen under particular assumptions by focusing on key drivers, complex interactions, and irreducible uncertainties (Polcyznski, 2009). The prospective scenarios created are the best and probable scenarios. Current or existing situations/conditions of the university served as the probable scenario, while the ideal case situation served as the best scenario. From the scenario built, key problems and challenges are developed as a basis for the model developed (Imperial, 2020). The model will provide the strategic long-term and short-term strategies for the university's academic operations **Figure 1**.

RESULTS AND DISCUSSION

Challenges on Teaching and Learning Amid the Pandemic

In the quantitative data gathered through an online survey, the students reported their concerns related to their learning experiences during the suspension of physical classes. Most of the student respondents reported that adjustments were made by the teachers in terms of course outcomes and syllabi. However, most of them claimed that the learning activities were not flexible enough to be done either offline or online as they could not as shown in **Table 1** comply with the requirements within the expected schedule.

Moreover, as shown in **Table 2**, students reported that the majority of them were unable to accomplish the tasks assigned by the teachers due to their inability to access the internet or use suitable gadgets to finish the tasks.

Part of the survey for students focused on how students reacted to home-based tasks assigned to them to complete the learning competencies of the course. Teachers provided alternative tasks online through electronic mails and an online portal **Table 3**.

Students confirmed that some online classes and additional requirements were still provided to them by the faculty (**Table 4**) The majority of the students responded that the alternative tasks were adequate. The nature and content of the alternative tasks provided were suited to the remaining concepts to be addressed in their coursework (**Table 4**). Despite that, several students still reported that these alternative tasks are not sufficient to enable them to acquire the remaining competencies required of them at the end of the semester.

Students in one college were surveyed on the receipt of feedback from their respective teachers. A comparable response from students claimed they received and didn't receive immediate feedback as to whether what they submitted to the professors is okay or what aspect they still need to improve more. As teaching continuity was made possible through online modality and other home-based tasks, they still had difficulty complying with the requirements of the course. The survey included the type of home environment the students have to assess factors that influence their difficulty. Students were asked whether their home learning environment is conducive to learning or not.

Data in **Table 5** show that learners believed that their home environment is not conducive for learning when schools were closed and physical contact was discontinued as there were many disruptions including internet connectivity. On the part of the faculty, there were challenges met as evidenced by the feedbacks of the students. The teaching-learning process requires an active engagement of the faculty. They are the drivers of the learning process and the success of the learning outcomes would partially

TABLE 1 | The profile of flexibility of the learning activities for offline or online learning among students (n = 1,689).

Responses	Frequency	Percentage
Flexible	215	12.73
Not flexible	1,181	69.92[a]
Not applicable	293	17.35
Total	1,689	100

[a]*Higher/Highest value.*

TABLE 2 | Number of students who reported if they have problems. Completing requirements due to ICT limitation (n = 1952).

Responses	Frequency	Percentage
Yes, I have.	1,589	81.40[a]
No, I don't have.	363	18.60
Total	1952	100

[a]*Higher/Highest value.*

TABLE 3 | Provision of alternative/additional requirement (n=1952).

Responses	Frequency	Percentage
Provided	1,189	60.91[a]
Not provided	720	36.89
Not applicable	43	2.20
Total	1952	100

[a]*Higher/Highest value.*

depend on their extent of active participation as facilitators, mentors, or coaches to the learners.

In the teaching-learning process, students need feedback on the progress of their outputs and whether they did well in their tasks. As shown in **Table 6**, the majority of the students reported receiving no feedback from their teachers on the online module while a majority hope to get immediate feedback. Further exploration is required to determine why teachers are unable to provide immediate feedback for students.

Faculty and Students' Access to Technology

One of the modalities in teaching and learning that gained popularity amid COVID-19 was online learning. When classes were suspended, universities migrated from the face to face interaction to the online modality. Hence, this survey was conducted to determine the capability of the students and teachers in terms of available information technology gadgets and connections.

The profile of both the faculty and students' access to internet-based information showed that the majority can access this information (**Table 7**). Moreover, the majority of the students (82.61%) and faculty (94.4%) have internet access **Table 8**. However, most of them reported unstable internet connections which makes their home environment less conducive to sustain learning facilitated by the online readings and activities given **Table 9**. The majority of the students used mobile phones for online learning which is not capable of addressing online tasks

TABLE 4 | Adequacy of alternative tasks for learning attainment (n=74).

Responses	Frequency	Percentage
Adequate	43	58.1[a]
Not adequate	17	23
Not applicable	14	18.9

[a]*Higher/Highest value.*

and submission of requirements. On top of this, concerns for limited internet access of students and faculty emanate from external service providers most especially when using cellular data in areas where satellite signals are limited.

Emerging Themes in Teaching and Learning

A qualitative survey was also conducted to substantiate the quantitative data gathered. The narrative comments of the respondents in the survey were analyzed and were grouped into emerging themes and scenarios of teaching and learning.

Theme 1

The Trajectory Towards Flexibility in Teaching Design, Delivery, and Assessment

The sudden cancellation of classes in the middle of the semester placed both faculty and students unprepared. Questions on how to continue their classes, the learning modality, the appropriate assessment, and access to learning materials were foremost in the mind of both teachers and students. The narratives of the respondents became the basis for identifying the emerging scenarios in teaching and learning amid and beyond the pandemic.

For many years, students have been exposed to traditional, face-to-face classroom-based teaching. Outcomes-based education has been integrated into the curriculum and its implementation, but the learning delivery is still under the actual supervision of teachers. Due to ECQ students have to shift to independent learning through the home-based tasks assigned to them by their teachers. Ordinarily, many students have trouble making the transition to the more independent learning required at university compared with their secondary years.

> *"It's very difficult for me to learn on my own in the confines of my home, but I don't have a choice,"* narrated one student.

This shows that this pandemic has created a new platform in teaching and learning delivery that students are compelled to accept. In this situation, students have to take responsibility for their learning, be more self-directed, make decisions about what they will focus on how much time they will spend on learning outside the classroom (The Higher Education Academy, 2014; Camacho and Legare, 2016). In the new setting, students are expected to read, understand and comply with the tasks without the guidance of the teachers. They are forced to assume self-directed independent learning.

The teachers on the other hand affirmed that the use of face-to-face delivery would not work anymore in the new learning environment.

TABLE 5 | Students learning environment.

Responses	Frequency	Percentage
Yes, it is conducive.	617	31.61
No, it is not conducive.	1,335	68.39[a]
Total	154	100

[a]*Higher/Highest value.*

TABLE 6 | Feedback from teachers (n = 154).

Responses	Frequency	Percentage
Yes, I received feedback	87	56.49[a]
No, I did not receive feedback	67	43.51
Total	154	100

[a]*Higher/Highest value.*

TABLE 7 | Faculty and students' access to information technology (n = 4,072).

	Frequency	Percentage
Yes	3,851	94.6%[a]
No	221	5.4%

[a]*Higher/Highest value.*

TABLE 8 | Faculty, staff and students' access to internet/Wi-fi.

	Frequency	Percentage[a]
Faculty	238	94.4 (n = 252)[a]
Staff	155	89.1 (n = 174)
Student	3,012	82.61 (n = 3,646)

[a]*This question utilized multiple responses from different sample.*

TABLE 9 | Stability of internet connection (n = 1952).

	Frequency	Percentage
Yes	511	26.18
No	1,441	73.82[a]

[a]*Higher/Highest value.*

> "*One thing that I have learned is to adjust my materials to ensure that learners can still acquire the competencies without the face-to-face interaction with my students*" narrated one teacher.

With the concerns on access to online services, faculty members considered the use of a non-online approach and explored the necessary modifications that can be applied in the future. Hence, in the narrative, several faculty members said they have prepared modules as an option for pure online learning delivery.

Assessment of student learning outcomes is very important. A concern on how to assess learning outcomes and how to answer assessment tasks emerged as a major concern as reflected in the narratives of the teacher and student respondents. The assessment measures are essential as an assurance that learners have attained various knowledge and skills and that they are ready for employment or further study (Coates, 2015). There is a need to address the teachers' concern on how to conduct off-classroom performance evaluation and the bulk of submissions that they have to evaluate which are submitted online or offline. The design and planning are important factors to consider not only in the assessment per se but also in the parameters on how students will be graded (Osborn, 2015). For the teachers, the following concerns emerged,

> *"Difficulty assessing performance-based tasks (RLE),"* *"Difficulty tracking, checking of students' outputs"* and *"Concerns on failing due to non-submission of requirements online and low midterm Performance"*

In the assessment of learning, the teacher respondents agreed that they have to think of innovative ways of assessing students in the context of their situation and home environment so the outcomes expected of the course will be manifested by the students.

One of the challenges of online or distance learning is the difficulty in participating in groupwork activities. The challenge is how the schedule or availability of group members be accommodated within the group (Gillett-Swan, 2017; Kebritchi, Lipschuetz, and Santiague, 2017). More particularly when online assessments are done with certain deadlines or time limits.

> *"Difficulty complying group activities"*
> *"Time-based online exams"*

The challenges seen in this phase are to determine the flexible learning system most applicable for CNU learners, the readiness of the students and faculty to handle the tasks to assign and to be complied by the students, the appropriateness of the learning delivery vis-à-vis learning outcome, and the preparation of the learning materials fit for self-directed independent learning.

In times of disaster, the educational system takes on a different route for effective learning continuity. The learning curriculum requires it to be more responsive to the current needs of the learners and the teachers.

> *"Concerns in completing OJT"*
> *"Dissertation/Thesis defense scheduled"*
> *"Concerns on when the academic year ends"*

The flexibility that the curriculum has to adopt requires the offering of choices on the current reality of the educational environment and customizing a given course to meet the needs of the learners. It is therefore crucial in considering the provision of the possibility of making learning choices to learners. These learning choices can cover class times, course content, instructional (Huang et al., n.d.).

It is a challenge for the university to consider the restructuring of the curriculum to address the gaps in the learning outcomes left when classes were suspended and the re-scheduling of the mid-semester On-the-Job Training of some programs. Amidst this crisis, flexibility in the next academic calendar has to be

TABLE 10 | Scenario matrix.

Best scenario (resumption of face-to-face interaction within the remaining semester)	Probable scenario (resumption of face-to-face interaction in the new school year)	Worse scenario (sustained quarantine and face-to-face interaction is not allowed in the new school year)
Curriculum and Instruction		
1. Planned curriculum		
a. Learner-centered curriculum adjustment	a. Curriculum as approved by the BOR last 2018	a. Consider the re-scheduling of courses for the 1st Semester SY 2020–21;
b. Data-driven curriculum flexibility	b. Planned re-scheduling of OJT on the 1st Semester SY 2020–2021	b. Temporary offering of left out courses on a trimester basis until the pandemic is contained
c. Re-scheduling of subjects within the semester (theory first half of semester/Lab or RLE second half)		c. Delay opening of classes for 1st semester SY 2020–21 to September onwards
d. Discipline-based review of learning outcomes not covered due to ECQ and integrate catch-up sessions for the succeeding semester	c. On-going plans for learning outcomes not covered	d. Discipline-based review of learning outcomes not covered due to ECQ and integrate ONLINE catch-up sessions for the succeeding semester
		e. Refocusing of course content to Lifelong learning and Learning at Home innovations
e. Syllabi integrate innovative and flexible learning strategies	d. Planning phase for syllabi development	e. Syllabi integrate innovatively and flex learning through full online strategies
2. Instruction (teaching-learning process)		
a. Innovative and flexible learning delivery with consideration of the learners and teachers' capacity	a. Assigning of home-based tasks with some modifications for online delivery	a. Innovative and flexible learning full online delivery
b. Design and implement alternative education delivery models that will respond to the needs of our categories of learners	b. Sharing of learning materials through mobile communication or online media whichever is applicable for the students	b. Design and implement alternative education online delivery models that will respond to the needs of our categories of learners
		c. Use of virtual laboratory simulators that can be accessed through remote servers
		d. Shift from actual industry, clinical, or teaching client exposure to virtual simulated on-the-job training, clinical patient care, or conduct of online classes as a teaching practicum.
c. Innovative in-class/off-class schedule of classes to reduce risk of exposure to COVID-19 maximizing modules flipped classrooms as applicable	c. Four-days per week classes	c. Full online delivery of classes and laboratory activities
d. Use of e-books and online learning materials as a supplement to printed textbooks and references	d. Use of printed textbooks and learning materials	d. E-books and online references will be used for all classes
3. Learning assessment		
a. Flexible and alternative learning outcome-based assessment	a. Alternative home-based task and modification of the grading system	a. Flexible and alternative online learning outcome-based assessment
b. Online/Onsite comprehensive examination		b. Online course major examinations
		b. Full online comprehensive examination
c. Online Thesis/Dissertation defense		c. Full online Thesis/Dissertation defense
Student engagement		
1. Off-School Learning environment		
a. Engage parents/guardians in the course orientation at the beginning of the semester online or per arrangement	a. Parents' meetings are conducted for OJT or practice teaching purposes	a. Engage parents/guardians in the online course orientation at the beginning of the semester
2. Students' Progressive consultation		
a. Online and mobile-based portal for students' consultation and engagement	a. Student communication center with hotline numbers and group chat for concerns raised	a. Virtual student consultation platform
3. Academic Administrators and faculty		
a. Focused trainings on flexible learning	a. Access information and input on COVID new normal through webinars sponsored by CHED and SEAMEO	a. Focused trainings on flexible learning
b. Upskilling and rewire- upgrading skills and competencies to adapt to changing demands and opportunities with online training on MOOCs and modular teaching		b. Upskilling and rewire- upgrading skills and competencies to adapt to changing demands and opportunities with online training on MOOCs
c. Reskilling and reconfiguring-acquiring skills and competencies in current, advance, or new areas of specialization within the discipline with training on		c. Reskilling and reconfigure-acquiring skills and competencies in current, advance, or new areas of

(Continued on following page)

TABLE 10 | (*Continued*) Scenario matrix.

Best scenario (resumption of face-to-face interaction within the remaining semester)	Probable scenario (resumption of face-to-face interaction in the new school year)	Worse scenario (sustained quarantine and face-to-face interaction is not allowed in the new school year)
facilitating online lab courses and conduct of alternative lab teaching d. Cross-skilling and Re-imagine-Learning skills and competencies to carry out roles outside their existing discipline/expertise with training on counseling services		specialization within the discipline with training on facilitating online lab courses d. Cross-skilling and Re-imagine-Learning skills and competencies to carry out roles outside their existing discipline/expertise with training on online counseling services
Technology and infrastructure		
a. The university has a functional learning management system and teleconferencing system for simulation classes	a. The university has internet connectivity within the campus	a. Creation of an office on eLearning as the central hub of the university's online learning portal
b. Stable internet connectivity for employees and students within and outside the campus	b. Students and employees no internet connectivity or stable connectivity	b. Establish a fully functioning learning management system and teleconferencing system for simulation classes
c. ICT gadgets are available for students' use at home setting through the ICT gadget student loan program	c. Most students do not have ICT gadgets at home	c. Stable internet connectivity for employees and students within and outside the campus d. ICT gadgets are available for students' use at home setting such as laptop, pocket Wi-Fi, printers through the ICT gadget student loan program e. Support for employees and students' internet subscription for online classes f. Develop a platform for a work-at-home arrangement
d. Alternative electronic library service delivery of resources	d. Majority of the references and learning materials are printed copies e. Available electronic journals	f. Shift to a virtual library
e. Establish an online system for services at the registrar, online payment system while maintaining some physical transactions	f. Transactions at the Registrar, Accounting, and other offices is on face-to-face set up g. Set up of remote servers for grades submission onlin	g. Online system for all services in the university for internal and external clients
f. Classroom set-up maintains physical distancing through student cubicles	h. Classroom set-up does not maintain physical distancing	h. Establish virtual classrooms in all courses

considered while it is uncertain when the COVID-19 crisis will be contained.

Theme 2

The Role of Technology

In the overall narratives concerning teaching-learning delivery and assessment, the role of information technology particularly on internet connection has been repetitively mentioned by both teachers and students. In the crisis scenario, faculty and students could eventually bounce forward to the usual teaching-learning activities outside the classrooms had this concern been made available to all. Per survey results, most of the students and some faculty members are residing outside the city and are experiencing unstable if no internet connection at all.

> "*No internet connectivity/unstable connectivity*"
>
> "Occasional *power* interruptions"

In designing for online or distance learning, there is a need to understand the role of technology to attain the success of the engagement (Kerka, 2020). Internet is not the only factor to consider but also the equipment that is needed for the teachers and the learners to engage effectively. If these are not available, there is a need to evaluate the approach used in the teacher-learner interaction.

> *"Limited gadgets (one laptop shared with other siblings/ no laptop or PC only phone)"*
>
> *"No printer for completion of a requirement to be submitted"*

With the current health crisis with the shifting of learning delivery, the challenge would be on how to provide an inclusive IT infrastructure to provide quality education for all learners (Internet access and education: Key considerations for policy makers, 2017).

Theme 3

The Learner's and the Teacher's Learning Environment

In an attempt to address the disruption of classes and promote continuity of learning, teachers immediately resort to online learning as the most workable way of delivery of the lessons. In this new learning setup, students are forced to stay at home and transfer their classrooms to the same location. In most cases, it is often overlooked that learners come from different home settings and have different home arrangements.

"Not appropriate learning environment (congested home setting)"

"Lack of support from parents (assigning home tasks when a student is supposed to be work on learning tasks)"

"Overlapping of home activities and academic activities"

In most cases, families frequently engaged their children in learning activities, however, different patterns were observed across different social groups. Families in low socio-economic position households, and those living in disadvantaged neighborhoods provided fewer learning experiences. This may in part be due to the challenges that families living in socially and economically disadvantaged circumstances face in accessing the financial and social resources needed to provide a rich early home learning environment for learning. The findings reveal that education is still pursued in economically challenging settings but with more challenges. A home learning environment has a positive "direct association" with a child's academic performance (Australian Institute of Family Studies, 2015). The findings require a three-helix platform in education that is the partnership between academe, industry, and the stakeholders.

Theme 4

Maslow Before Bloom Orientation: Safety and Security

Prevailing sentiments among employees and students are their concern for their safety and security. The basic needs of humans according to Maslow's Hierarchy of needs are foremost in the minds of the university's clients and workers. As reported by the students and employees, their foremost concern is safety and the psychological manifestations of the anxiety of being infected.

"Foremost concern is safety and security even after ECQ is lifted"

"Fear of being infected with COVID"

"With PUI/PUM family members or the students themselves"

"Psychological and emotional reactions (anxiety, panic, fear, loneliness, a feeling of helplessness, mood swings, anger)"

The second category of concerns is on security and the possibility of sustaining their education due to loss of jobs, loss of family members, and the uncertainty of traveling to the university.

"Family financial crisis–no budget to buy loads, sustain needs"

"Unable to go home"

"Transportation concerns"

The concerns raised by the participants of the study require the university to provide access to considerable support to deal with the struggles, challenges, and even trauma because of the pandemic. There is a need to help manage mental health, self-esteem, and relationships after the quarantine which left some of the students isolated for quite a time (Sweeney, 2020). Mental health programs have to be in place in formal learning settings. Because of the unprecedented challenges that students and teachers experienced in the pandemic, the ability to successfully hurdle through formal learning may be limited if the overall well-being is compromised.

Strategic Scenario Analysis

This section presents the analysis of the possible scenarios that might take place in the university based on the following components: the planned curriculum, instruction (teaching-learning process), assessment, student engagement, and technology and infrastructure. The probable scenario is the current enhanced community quarantine (ECQ) status of the City or province where the university is located. During ECQ, no face-to-face interaction is allowed and province-wide lockdowns are implemented. The best scenario allows the limited face-to-face class and the worse scenario happens when the locale is under ECQ and placed on a lockdown due to the increasing COVID-19 cases.

In the area of curriculum and instruction, the action points revolved around the identification of courses that can be flexibly offered, rescheduling offerings when health measures permit it and providing interventions for competencies that were not met. The additional action points would refer to the creation of materials that would meet the needs of the students in the different scenarios and the provision of access to all resources that aid learning. Lastly, plans for assessment delivery are laid out to ensure the validity of means and with consideration to quarantine measures. Laying down the scenarios provide options for the educational institution to be able to meet the demands of the changes enforced by the pandemic to the delivery of learning to students. Reviewing these options reveal that the differences in the plan of action for this area of concern are a matter of granting access to students for resources needed for learning continuity.

The next area of concern is student engagement which reveals the different levels of engagement of parents and guardians, the means of communication with students, and an investment in the capability-building of faculty members to facilitate the teaching-learning process amid the pandemic. The focus on the trainings for the faculty members in the area implies that flexible learning in this health crisis requires a particular skill set to heighten student engagement without diminishing the role of support systems in the students' homes and the need for appropriate technology to facilitate the needed interactions. This leads to the last area of concern on technology and infrastructure. The University has to take into account and facilitate the provision of needed equipment, materials, systems, software, and physical structures to support flexible learning. The complete scenario matrix is reflected in **Table 10**.

Migrating to Flexible Teaching and Learning: The University's Strategic Response for Academic Continuity

After exploring the perspectives of the respondents and the analysis of the emerging scenarios in teaching and learning, the

University implemented the proactive response to ensure academic continuity in times of crisis. It is evident that for universities to thrive and lead, the flexible teaching-learning modality needs to be adopted taking into consideration the best and worst-case scenarios. Migrating to flexi learning means recalibrating the written curriculum, capacitating the faculty, and upgrading technological infrastructure to respond to the changing scenarios amid and beyond the pandemic. Outlined in the paragraphs that follow were the ways forward pursued by the university as a response for academic continuity.

Recalibrate the Curriculum

To address the competencies which were left at the time of the class suspension, discipline-based course mapping was conducted. A series of cluster meetings by faculty members teaching similar courses teaching load were done for the revision of the unified syllabus, integration of the outcomes-based teaching and learning strategies using flexible learning platforms such as distance and online learning options, and the learning assessment strategies suitable for individual student needs. A syllabi repurposing is conducted and the revisiting of the syllabi focusing on the essential course outcomes. This strategy enables the faculty to revise the activities/course work/tasks/experiences that can be delivered through blended learning. This also enabled them in designing the instructional strategies, activities, and assessments that will achieve the learning objectives. The modification of the syllabi incorporated the development of modules, assessment tasks that can be delivered using differentiated instruction/in class or off class.

A program-based curriculum review was also conducted to identify courses that would need to be re-scheduled in its offering due to its nature and requirement such as swimming courses. Moreover, On-the- Job (OJT) which was supposedly offered during summer or mid-year was transferred to a later semester as industry partners are limiting its personnel at the height of the pandemic.

Reconfiguring the OJT, practice teaching and Related Learning Experience based on simulation set-up with scenario-based activities with assigned equivalency hours was also developed. The Practice teaching using blended learning or online approach, Nursing used alternative Related learning simulation.

The strategic actions included short-term plans of possible limited physical classes and long-term plans of pure online classes. Embedded in the plans are the in-class and off-class mode, re-structuring and retrofitting requirement for limited face-to-face classes, and the upgrading of internet-based facilities for pure online classes. On top of this, they need to cater to learners who have no access to the internet includes the translation of online learning modules to printed modules.

Capacitate the Faculty

Flexible learning capacitation of faculty was also addressed as online learning was new to the university. The university conducted an upskilling and rewiring through series of online trainings on module development for flexible learning distance education and the use of an online learning management system for faculty members. Reskilling and reconfiguring of faculty through webinar series on laboratory teaching using simulation learning for teachers handling laboratory, RLE, OJT. And a cross-skilling and reimagining using series of online webinars on developing counseling skills of faculty members concerning the COVID crisis. The university initiated the Higher Education Connect webinar series by discipline which served as an avenue of sharing and exchanging best practices during the pandemic-induced suspension of physical classes. The series of online for and webinars provided the teachers' professional development including information sharing platform, Online learning platform, Hands-on training platform, Repository of web tools, and Laboratory for data analytics.

Safe learning infrastructure for Reframing Teaching and Learning was addressed through Telecounseling Services with mobile hotline numbers to cater to the needs of the clients and Student Communication Center with hotline numbers accessible by phone or online to cater to the academic concerns of the students. The university also initiated the Adopt-a-Student program for stranded students during the Enhanced Community Quarantine and assisted in the process of going back to their provinces.

Upgrade the Infrastructure

The university's priority is to ensure that technology is sustainable and feasible. The ICT focal persons of the university were mobilized to Determine basic computer configuration and minimum Operating System requirements and provide alternative solutions to learners with technological/location-related challenges. For example, provide small learning activity packages for learners with slow internet connections. Ensure changes to the learning activity that can be made with internal resources. Determine the characteristics, possibilities, and limitations of the learning management system (LMS) to be used and ensure consistency of access across platforms (if applicable).

An Organizational Structures as a support system was also created which was the Center for Innovative Flexible Learning to provide assistance and monitoring so that the existing Information Technology Office of the university will not be overwhelmed.

It is also strategic to develop collaboration with stakeholders (Local Government Units (LGU), Alumni, Partner agencies). The forging of partnerships with LGU provides avenues where students during off-class students will go to the learning hub in the LGU complete with internet connectivity for students to work on their tasks in case they don't have connectivity at home, so students will not go to the internet café and pay. This will also provide opportunities for resource sharing for the benefit of the students.

ICT Infrastructure in teaching and learning and student services was also addressed through Online enrollment, full utilization of Google Classroom as the learning management system, and the fully online delivery of classes. The university also changed its internet subscription to higher bandwidth and subscription to zoom for online

meetings and conferences. Internet Connectivity of faculty members has assisted a monthly internet allowance. Gadget on loan for students in coordination with Student Supreme Council. Library online services through Document Delivery Services (DDS) and Modern Information Assistant in the New Normal Innovative Education.

Implementation and On-Going Assessment of the Strategic Response

The implementation of the strategic response entails the collaborative engagement of all stakeholders in the university. The process requires the involvement of the administration, faculty, staff, students, parents, and other stakeholders that enables the institution to move forward, managing and mitigating risks successfully. Hence, the university is implementing the continuous process of consultation, feedbacking, and intensive monitoring as important ingredients for the plans to be successfully implemented. The regular conduct of dialogues and discussions among stakeholders, capacity building of students and faculty, open communication through hotline centers, and continuous quality assurance monitoring mechanisms enable the university to enhance and implement successfully the strategic programs and activities amid the pandemic.

Anchored on the initial success of the evidenced-based strategic plans, the university at present has institutionalized the flexible learning system with the establishment of the Center for Flexible Learning that manages, capacitates, and assists the students and the faculty members in the continuing implementation of the flexible learning modality. Technology support has been provided by increasing the internet bandwidth to ensure uninterrupted connectivity in the campus and providing internet allowance to the faculty. Students with limited or no connectivity are given printed modules as instructional resources. In anticipation of the limited face-to-face classes as safety and health protocols may allow, the curricular offerings, teaching-learning processes, and assessment tools have been enhanced by applying best practices that maximize quality teaching and learning. On-going trainings and webinars for the faculty, students, and stakeholders to thrive in the new educational landscape have been conducted. The university has also established professional learning communities which become avenues for the sharing of resources and practices that continuously support and enhance teaching and learning continuity amid and beyond the pandemic.

CONCLUSION

Teaching and learning continuity amid the pandemic requires an analysis of the parameters by which the university operates from the perspective of the stakeholders to include the students, faculty, curriculum, and external stakeholders. Grounded on data, higher education institutions have to conduct strategic scenario analysis for best, possible and worse scenarios in the areas of curriculum and instruction, student engagement, and technology and infrastructure. To ensure teaching and learning continuity amid and beyond the pandemic, higher education institutions need to migrate to flexible teaching and learning modality by recalibrating the curriculum, capacitating the faculty, and upgrading the infrastructure. These strategic actions have to be continuously assessed, modified, and enhanced to respond to the volatile, uncertain, and changing scenarios in times of crisis.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusion of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

FD, DP, LG, and MO contributed to the conception and design of the study. DP and LG organized the data and facilitated the initial analysis. FD and DP wrote the first draft of the manuscript. All authors wrote sections of the manuscript and contributed to the manuscript revision. MO ran the final plagiarism test and grammar check prior to submission.

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