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Perspectives on flexible learning towards the development of proposed quality assurance framework for HyFlex learning

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ABSTRACT

Quality assurance is a significant part of achieving sustainable development goal 4 and has remained a challenge to higher education institutions (HEIs) worldwide. Thus, this paper aims to propose a quality assurance framework for hybrid-flexible (HyFlex learning) learning based on the perspectives of faculty and students. This study utilized a descriptive developmental mixed-method research design to dissect the richness and beauty of the data collected using the self-developed survey questionnaire and interview protocol guide. The findings revealed that both students and faculty preferred the utilization of flexible learning as their learning modality. Also, a significant difference when grouped according to UNESCO's quality and learning indicators is also observed in the study. Accessibility and usability, learning assessment strategies, vision and institutional leadership, learning activities and learning interaction, instructional materials, social and student engagement, stakeholders' support, course structure, learning outcomes and competencies, evaluation and feedback, social and student engagement, flexibility and adaptability of education, security and safety, and infrastructure, facilities, and equipment were the emergent themes which were utilized to craft the quality assurance framework. The proposed framework provides a transparent and reliable workflow for implementing, monitoring, and evaluating quality assurance of all HyFlex learning modalities in the university.

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1. INTRODUCTION

The current global pandemic's impact has altered how people live, think, work, learn, and even feel. It also challenged this current global socio-political, economic, and academic landscape. According to the World Economic Forum [1], the COVID-19 pandemic brought changed in the education set-up because of the abrupt school closures across the planet affecting over 1.2 billion students.

Since the advent of the internet, online education, open distance learning, and e-learning have grown in popularity. However, the pandemic compelled all academic institutions to embrace online distance learning completely. Schools and colleges have not been so disrupted for generations, but despite the difficulties, the modern era gives us numerous technological advancements that will allow us to continue our education afar.

There are several ways in which traditional in-person education is set up differently from online teaching and learning. The learner is separated from the teacher, and instruction and learning are mediated by technology [2]. Numerous studies have shown that students' experiences in online or remote learning should be

as rich and intellectual as those in a regular classroom [3] and the subject of quality learning in online or distance education has been a study trend since 2020. Thus, the significance of quality assurance is highlighted.

The commission on higher education, the department handled tertiary education in the Philippines, adopts flexible learning under Commission on Higher Education (CHED)-Memorandum Order (CMO) No. 4, series of 2020 to address the need to continue quality learning despite the worldwide pandemic. Flexible learning allows innovative learning modalities as learners may choose the delivery modes responsive to their need for access to quality education. Higher education institutions (HEIs) were tasked to create a learning continuity plan that will enable the continuous delivery of programs and courses unique to the needs of the learners. Bulacan State University is committed to producing quality graduates despite the current situation. The flexible learning options include online learning with two modalities i.e. synchronous learning (SL), asynchronous online learning (AOL), and remote print learning (RPL), or the utilization of modules to finish the learning contents. However, RPL has been discontinued due to challenges in terms of mobility and quality.

The necessity of employing quality assurance to enhance inclusivity, equity, and lifelong learning for all was emphasized by the sustainable development goals. Every educational activity is supported by UNESCO's ongoing promotion of access to high-quality education as a human right [4]. According to this strategy, the learner and the teacher are two of the most important elements in attaining education quality.

Since the labor market's needs are subject to environmental factors like COVID-19, which will have an impact on changing employment and education regulations, challenges in quality have become a growing issue, especially for businesses [5]. HEIs must adapt to the changing contexts as labor markets continue to change, as will quality assurance, as new skill profiles will develop, and employment will take on new shapes. Therefore, as Hanna and Hanna [6] noted in their study, qualifications must be of a high quality that can be trusted, and quality assurance must adjust to the rapidly changing nature of the job market.

This context led to the formulation of external quality assurance (EQA) procedures in higher education to respond to the uprising issues and concerns about the delivery of quality instructions in the HEIs. In response, HEIs have responded set-up internal quality assurance (IQA) schemes and mechanisms for university management and evaluation, even though this phenomenon is externally driven. External assessments like accreditation, quality audits, and regular evaluations have also been flexible during the pandemic. As cited [7], international quality assurance can have an academic, managerial, pedagogical, or employment focus. IQA's primary goal would be to improve students' learning experiences because the prevalent techniques now emphasize the quality of student learning [7], [8].

Therefore, identifying key-indicators and factors in assessing quality should be clearly defined using a quality assurance mechianism or a framework that adhere to the demands of 21st-century learner-focused instead of institution-focused [9], [10]. Wang [11] furthermore emphasizes the importance of involving teachers and students in quality assurance to help define quality in HEIs. Teachers and students are the most important aspect of the teaching and learning process and their perspectives on the other components of education will be useful, especially during the pandemic. Quality assurance needs to focus on new issues and adopt new ways of functioning [7] so regular assessments of the flexible learning modalities are critically important to improve their quality.

Thus, this study aims to develop a quality assurance framework designed to assess the quality of flexible and HyFlex learning modalities based on the perspectives of teachers and students. Their understanding and interpretation of quality in different contexts will help develop approaches to monitor and improve the system. This quality assurance framework for improvement will comprehensively cover all interrelated components of the education system and will allow opportunities for change and reform to be identified. The framework will guide HEIs, faculty, and students to conduct a comprehensive quality assurance assessment of the HyFlex learning modalities to discover its strengths and weaknesses, and opportunities for continuous improvement.

The influence of the pandemic on education, universities, professors, and students became a topic of significant interest for researchers because of the exceptional circumstances caused by the coronavirus pandemic. Deli and Allo [12] looked at how students felt about online learning during the pandemic, it was found that they had a favorable opinion of it and thought it would be beneficial during the crisis the pandemic had caused. In a study by Suresh *et al*. [13] involving 424 universities worldwide, it was discovered that the pandemic impacted institutions in terms of research, conferences, international mobility, and the delivery of education. Most universities stated that they had to adopt online learning and overcome many obstacles, the most significant of which were access to technology and instructors' capacity to deliver online courses.

Most colleges were not prepared for an online experience, even though several had used e-learning as a supplementary approach before the coronavirus outbreak. So, the e-learning process needs to be optimized to continue providing education in a good manner. The researcher [14], [15] states that this optimization should also consider student-teacher interaction. The language used in communication between

students and teachers should be simple but incorporate terminology relevant to their field of study. In addition, found that students believe instructors should be able to modify their lectures for the online environment rather than merely transferring information that was typically taught traditionally, and that they should assign enough projects and assignments [16].

A more recent study by Pratama [17] indicated that university students were not implementing e-learning in the best way possible. Different interaction systems for synchronous and asynchronous communication were developed. Only 10.58% of pupils had used both strategies. The biggest barriers to using the internet were budget, internet quota, and access. This study provides thorough e-learning training for educators and anticipates educators and stakeholders reviewing the implementation of e-learning. Another study at Leyte Normal University discovered that students' opinions of online education indicate that it is beneficial during the COVID-19 pandemic. They believed that, during the pandemic, online learning was extremely beneficial. This study shed light on the accessibility of internet access, budgetary concerns, and the adoption of online learning in addition to stating that online learning is beneficial during the COVID-19 epidemic [12].

On the other hand, online learning does not yield the anticipated outcomes because the great majority of students cannot access the internet because of financial and technological limitations. Other difficulties raised by college students included the instructor's lack of face-to-face engagement, response times, and the lack of typical classroom socialization [18]. Although online education is expanding quickly, it is still in its infancy. Since student perception and attitude are crucial to motivation and learning, developers and providers of online learning need to better understand how students perceive and respond to parts of flexible learning. They also need to know how to apply these approaches to improve learning. Martin [19] points out, the term "quality" has been used in a lot of literature as a general notion. characterizes it as a hotly debated topic with multiple definitions [20]. As a result, quality assurance is responsible for creating a set of standards that outline the qualities and quality model.

Quality assurance is the process by which an institution can ensure that the standards for teaching and learning set by the institution itself or other awarding organizations are being maintained and improved, [21] as cited in [22]. As a result, quality assurance is essential to an institution's monitoring and assessment of its operations and performance to ensure constant and ongoing improvement. Bank and Popoola [23] quality assurance also refers to a systematic, structured, and ongoing focus on maintaining and enhancing quality. Everyone in higher education, from the top management who sets the policies and priorities to the less experienced staff members, is accountable for quality assurance. The definition of quality assurance as being equivalent to academic standards is consistent with the rising importance of student learning outcomes in higher education policies, or the specific levels of knowledge, skills, and abilities that students attain because they participated in each educational program [24]. Moreover, quality, standards, and relevance are the three key components of quality assurance. Quality is the sum of a products or service's features and qualities that have an impact on its capacity to satisfy explicit or implicit needs [25].

2. METHOD

2.1. Research design

The researcher utilized a mixed-method research design wherein both quantitative and qualitative research techniques were used to analyze the perception of both the students and faculty on flexible learning. Specifically, the study used the descriptive developmental method to further deepen the result of the study by designing and developing a quality assurance framework for hyflex learning. The descriptive method seeks the real facts about a current situation [26]. Developmental methods are a body of research literature that pertains directly to instructional development, which means the output will be developed after conducting this research. In other words, a descriptive developmental method is a systematic study of putting into the design, development, and careful evaluation of instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness.

Table 1 presents the contextualized procedure of a descriptive developmental mixed-method research study based on the procedures from the study of Cruz and Dizon [27]. In this method, the quantitative or numeric data is gathered and analyzed first, followed by the qualitative or text data, which assists in explaining, expanding on, or extending the quantitative conclusions acquired in the first phase. Because the researcher used the quantitative data to identify and purposefully choose individuals for follow-up, the focus of this study was on the second qualitative phase. To see the richness of genuine social experience, in-depth interviews go "beyond the statistics" that were collected in the quantitative study. In the intermediate stage of the research, the two phases of the study were linked. The research in which participants for a qualitative inquiry were chosen. After both phases were completed, the findings were fully integrated and commented on during the discussion of the whole research study's conclusions.

Table 1. The four stages of descriptive developmental research [28]

First stage Analysis	Second stage Design	Third stage Development	Fourth stage Evaluation
Phase 1: systematic review of quality standards and indicators. Flexible and HyFlex learning.	Phase 3: analyze the perspectives of students and teachers using the quality and learning indicators.	Phase 5: develop the quality assurance framework using the results of the quantitative and qualitative data.	Phase 7: expert review of the quality assurance framework (state universities and colleges (SUCs) in region 3).
Phase 2: assessment of students' and teachers' perspectives towards flexible learning.	Phase 4: conduct focus group discussions (FGD) and interviews.	Phase 6: redevelop the quality assurance framework based on UNESCO's quality and learning indicators and quality matters checklist.	

Source: a proposed natural science e-instructional system design (E-ISD) for the Mendiola Consortium [28].

2.2. Participant selection

The quantitative part of the study involved 518 students as the representative sample which was computed using Slovin's formula since it allows researchers to get the population with a desired degree of accuracy. A simple random sampling will be used since there are more than nineteen thousand student respondents involved.

The qualitative part employed a purposive sampling method both for student and faculty participants. Only faculty members from the servicing colleges (arts and letters, math and sciences, and social sciences), either regular or full-time part-time handling 18 units and above, with more than 5 years of working experience in the university were the faculty participants as the narrowness of inclusion/exclusion criteria have a direct impact on the study's recruitment and feasibility, while the broadness of criteria can affect the data's integrity [29]. The fishbowl method was used to identify the faculty participants who took part in the FGD. The names of the students and faculty members per department of the servicing colleges who are handling general education courses were written and drawn randomly. A total of 7 faculty participants were selected. The evaluation of the quality assurance framework for HyFlex learning was done by three SUCs in the region. These SUCs are known for quality assurance and will surely help in the evaluation of the quality assurance framework.

2.3. Instrumentation

A questionnaire is the primary data-gathering tool for the quantitative part of the study, the content of the questionnaire was created by reading related literature and studies, and the indicators were based on the definition of flexible learning from CMO No. 4, series of 2020, "Guidelines on the implementation of flexible learning". There are two phases of instrument tools that were utilized in this study: quantitative and qualitative steps. In the quantitative phase, the structured survey questionnaire consists of two parts. The first part of the questionnaire contained a series of socio-demographic variables based on UNESCO's quality and Learning Indicators. This information was used for the purpose of descriptive analysis. Part 2 was the student and faculty perceptions on flexible learning which is divided into six components. The six components are learning style/preference (teaching style for faculty), accessibility (time and place), availability of devices, connectivity and learning management system (LMS), level of digital literacy, approach/pedagogical practices, and overall perspective on flexible learning. The results on internal consistency turned out to be 0.91 for the students and the faculty questionnaire obtained a reliability coefficient of .96 considered acceptable based on the broadly acceptable reliability coefficient of 0.70 [30].

2.4. Data analysis

For the quantitative data, the data were tabulated and processed via the statistical packages for social sciences (SPSS). Descriptive statistics were used (percentages, mean, and standard deviation). Analysis of variance (ANOVA) was used to determine the significant differences in the perspectives of faculty and students when grouped according to UNESCO's education quality indicators.

On the other hand, the qualitative data, deductive thematic coding analysis was used for the qualitative part of the study where information was collected via FGD. Thematic coding involves the transcription of recorded responsnes to formulate a common theme that would sum-up and generalize the rich responses of the participants. The generated themes would allow the researchers to craft the proposed quality assuarance framework [31]. A research assistant transcribed the recorded FGD, and data was analyzed deductively and identified major themes that were integrated with the result of the quantitative data.

3. RESULTS AND DISCUSSION

3.1. Profile of the students as determined by UNESCO's quality and learning indicators

There are a total of 518 student respondents coming from all the different colleges of the University.

- *Age:* Most of the student respondents are between 20-21 years old obtaining 63.7% or 330 which was followed by 27.8% or 144, and 6.18 or 32 students. There are 4 student respondents aged 24-25; 3 ages 26-27; 2 ages 28-29; and 3 who are 30 and above.
- *Gender:* Females dominated the student respondents having 59.07% or 306 while males comprised the 36.87% or 191. There are also 21 student respondents or 4.05% who opted not to disclose their Sex.
- *Socioeconomic background or family income:* Most of the respondents belong to poor families with less than Php 10,957-month income which comprised 41.7% or 216. 175 or 33.78% belong to low-income but not poor families with Php 10,957-21,914 monthly income; 80 or 15.44% belong to the low middle class with a family monthly income of Php 21,915-43,828; there are 32 or 6.18% middle-class students; 9 or 1.74% with upper middle income; 3 students under high income but not rich; and 3 rich with a monthly income of Php 219,141 above.
- *Parental support:* Among the 518 student respondents, 387 or 74.71% receive full financial support from their parents. They are full-time college students with no work.
- *Working students:* There are 181 working students or 25.29% who are working in various fields and roles. There are 31 food service crews; 8 business process outsourcing (BPO) representatives; 4 sales representatives; 36 tutors; 3 clerks; 18 virtual assistants; 8 delivery personnel; and 23 with varying roles in their workplaces.
- *Gadgets for online learning:* Most student respondents represented by 57.72% are using cellphones for their online classes; 42 or 8.11% own a desktop computer; 156 or 30.12% are using laptop; and 8 or 3.86% are using tablet.
- *Ownership of gadgets:* Most of the student respondents have enough ICT gadgets for online learning, 478 of them, or 92.28 owned the gadgets they are using. However, 23 student respondents shared their gadgets with their siblings, and nine were able to be provided by the university. Despite the huge number of students who have gadgets, still, eight students still do not have anything to use in their online classes.
- *Internet access:* The slow internet connection being experienced by students and faculty is not based on the provider. Student respondents have varying providers with converge occupying 28.57% or 148 students; Globe has 104 subscribers or 20.08%; PLDT with 139 or 26.83%; Smart with 59 or 11.39% and others 68 or 13.13% respectively.
- *LMS:* Student respondents prefer Google Workspace with 310 or 59.85% and only 198 or 38.22% in favor of MS teams.
- *Preferred learning modality:* Student respondents despite the lingering threat of COVID-19 still prefer full face-to-face with 250 or 48.26% of the respondents; 161 or 31.08% prefer asynchronous online; 98 or 18.92% prefer synchronous; and 9 or 1.74% prefer small private online course (SPOC).
- *Study time per day:* Student respondents spend on average 3-4 hours a day with 227 or 43.82%; 1-2 hours with 30.31% or 157 students; 5-6 hours of study time for 82 students or 15.83%; 7-8 hours for 29 students or 5.60%; and 23 students who are studying for more than 8 hours a day respectively.

3.2. Profile of faculty respondents

The faculty respondents are composed of faculty members from the servicing colleges of the University.

- *Years in service:* 9 faculty members have been serving the university for less than 5 years; 8 are in between 6-10 years; another 8 under 11-15 years; 5 with 16-20 years; 2 with 21-25; 1 with 26-30; and 1 with more than 30 years respectively.
- *Age:* Faculty respondents are well-represented when it comes to age. The 2 youngest faculty respondents belong to the 20-25 age bracket; 8 belongs to 26-30; 5 between 31-35; 5 between 36-40; 2 between 46-50; 4 between 51-55; 2 between 56-60; and 1 who is above 61 years old respectively.
- *Civil status:* Among the 34 faculty respondents, 16 are single and 18 are married.
- *Sex:* Females dominated the faculty respondents with 64.71% or 22 while males correspond to 35.29% or 12.
- *Employment status:* There are 22 permanent faculty members; 7 full time part-time; 4 part-time; and 1 on a regular temporary status.
- *Educational attainment:* Among the 34 faculty respondents, 7 are still pursuing their masters in their field of specialization; 20 were already masters pursuing their doctoral degrees while 7 are already doctors.
- *Internet connectivity:* Just like the student respondents, faculty respondents are also subscribed to different internet providers. Converge has 10 faculty subscribers; 7 are using Globe; PLDT has 11; 2 are using Smart; and there are 4 who responded to others.

- *Lesson preparation time:* Faculty respondents on average spend 3-4 hours in lesson preparation. There are 11 who are preparing for 1-2 hours; 15 who spend 3-4 hours; 6 with 5-6 hours; 1 with 7-8 hours; and 1 with more than 8 hours respectively.

3.3. Faculty and students' perceptions of flexible learning

Table 2 presents the students' perception of flexible learning from one state university in the City of Malolos, Bulacan, Philippines.

- *Learning style and preference:* Results show that student respondents "agree" with all the benchmark statements obtaining an average rating of 3.98. This only means that students prefer flexible learning because of its flexibility in time and place. Flexible learning also allows them to learn and study at their own pace which gives them the chance to figure things out by themselves and be independent. However, they are also distracted by the many things they can do which affect learning.
- *Level of digital literacy:* The data reveals that students have a high level of digital literacy with an average rating of 4.07 or "agree". Students have the knowledge and skills needed to effectively learn in an online environment. Students also know how to use the LMS, and different applications, can locate sources, and generally like using technology while learning. Students are tech-savvy individuals who prefer flexible learning.
- *Accessibility (time and place):* Accessibility obtained an average rating of 4.0 which may be interpreted as "agree". This only means that student respondents agree with flexible learning being accessible in time and place. Student respondents like the accessibility of learning materials in the LMS or drive which they can always review whenever they have questions and clarifications. Though they like learning in a place with less distraction and noise, they do not agree that attendance is not an important aspect of learning.
- *Approach/pedagogical practices*: Student respondents have a positive perception of the approaches and pedagogical practices their professors are using during their classes which are represented by 3.90 or "agree". They are satisfied with the pedagogical methods, interaction, and assessments, including the diverse output and activities.
- *Availability of devices, connections, and LMS:* Data shows that student respondents have available devices which make it easier for them to thrive in the flexible learning modalities obtaining a 3.78 average rating. Data also presented that they like the LMS, and they find it easy to navigate, locate files, submit tasks, and review lessons and recordings. However, contradicting views on having a stable internet connection resulted in a rating of 3.12 which stands for "neither agree nor disagree". This only means that not all student respondents have a strong internet connection within and outside the campus.
- *Overall perspective of flexible learning:* The student respondents' overall perspective shows they prefer flexible learning. It obtained an average rating of 3.90 which may be verbally interpreted as "satisfied". Students like flexible learning because it is low-cost and requires less effort compared to face-to-face. But, when asked whether flexible learning is more effective than face-to-face, students had varying answers which resulted in an average rating of 3.25 or "moderately satisfied".

Table 2. Students' perceptions of flexible learning

Indicators	Average	SD	Verbal interpretation
1. Learning style and preferences	3.98	0.78	Agree
2. Digital literacy	4.07	0.69	Strongly agree
3. Accessibility (time and place)	4.00	0.81	Agree
4. Approach/pedagogical practice	3.90	0.73	Agree
5. Availability of device, connection, and LMS	3.78	0.85	Agree
Overall	3.95	0.77	Agree

Table 3 presents the faculty perceptions of flexible learning from one state university in the City of Malolos, Bulacan, Philippines.

- *Teaching style:* Results show that faculty members use varying teaching styles in flexible learning modalities as shown by a 4.10 average rating with a verbal interpretation of "agree". Faculty prefer flexible learning because it allows independence and creativity among students, and encourages active learning, interaction, and collaboration. On the other hand, they do not agree with not monitoring students' attendance which is one feature of flexible learning.
- *Level of digital literacy:* Findings revealed that faculty members have the required technical skills and knowledge enough to facilitate flexible learning in all modalities as shown in the average rating of 4.69 or "strongly agree". Faculty members also agree that they need more training in using various digital tools to improve the teaching-learning process.

- *Accessibility (time and place):* Data showed that faculty members "agree" with the accessibility of flexible learning by obtaining an average rating of 4.31. Faculty, like student respondents prefer flexibility because it allows them to manage their time and do other things anytime, anywhere.
- *Approach/pedagogical practices:* Overall, the results revealed that faculty members "agree" that they are using various pedagogical methods, assessment strategies, and flexible learning activities that address the needs of the students. However, challenges on plagiarism and cheating abound in a flexible learning modality, and issues about student discipline and attitude worsen.
- *Availability of devices, connectivity, and LMS:* Data showed that faculty members have sufficient devices and are knowledgeable in the use of LMS, digital tools, and other equipment as represented by an average rating of 3.98 or "agree". However, with reliable internet connection in and outside the university, LMS that works in different modalities, and a helpdesk to support faculty members all obtained "neither agree nor disagree".

Table 3. Faculty perceptions of flexible learning

Indicators	Ave rating	SD	Verbal interpretation
1. Teaching style	4.10	0.75	Agree
2. Digital literacy	4.69	0.52	Strongly agree
3. Accessibility (time and place)	4.31	0.75	Agree
4. Approach/pedagogical practice	3.97	0.81	Agree
5. Availability of device, connection and LMS	3.98	0.86	Agree
Overall	4.21	0.74	Agree

3.4. Significant difference in the perception of students of flexible learning

Table 4 illuminates the test of significant differences in the perception of students on flexible learning when profile variables are considered. The ownership of the gadget obtained an F-value of 1.288 with a p-value of 0.037 which is lower than the alpha 0.05, this means that there is enough evidence to reject the null hypothesis and state that, *"there is a significant difference in the perception of students on flexible learning when they are grouped according to their ownership of gadget"*. The experience of students with flexible learning varies depending on whether they have a gadget or they are just sharing the gadgets with their siblings. This may also mean that students need their gadgets to thrive in a flexible learning environment. Schroeder *et al*. [32] elucidated, the other profiles like course, year level, age, sex, family income, ICT gadgets, internet provider, LMS used, number of hours studying, working student, and role in the workplace all have significant differences but not to a significant extent.

Table 4. Significant difference in the perception of students on flexible learning

Profile of the students	F-value	Sig.	Decision	Interpretation
Course	1.146	0.168	Do not reject Ho	Not significant
Year Level	0.875	0.807	Do not reject Ho	Not significant
Age	1.086	0.278	Do not reject Ho	Not significant
Gender	1.052	0.355	Do not reject Ho	Not significant
Family Income	1.022	0.431	Do not reject Ho	Not significant
ICT Gadget Used	1.164	0.141	Do not reject Ho	Not significant
Ownership of Gadget	*1.288*	*0.037*	*Reject Ho*	*Significant*
Internet Provider	1.191	0.109	Do not reject Ho	Not significant
LMS Used	1.047	0.367	Do not reject Ho	Not significant
Number of hours studying	0.965	0.586	Do not reject Ho	Not significant
Preferred Learning Modality	1.24	0.065	Do not reject Ho	Not significant
Working Student	1.097	0.255	Do not reject Ho	Not significant
Role in Workplace	1.102	0.244	Do not reject Ho	Not significant

3.5. Significant difference in the perception of faculty on flexible learning

Table 5 shows the test of significant differences in the perception of the faculty on flexible learning when profile variables are considered. The amount of time for lesson preparation obtained an F-value of 3.794 and a p-value of 0.028 which is lower than the alpha 0.05 which means there is enough reason to reject the null hypothesis and state that, *"there is a significant difference in the perception of faculty on flexible learning when they are grouped according to amount of time for lesson preparation"*. This only means that the amount of lesson preparation affects the experience of faculty on flexible learning in the University.

In addition, the mode of communication with students outside online classes obtained an F-value of 7.304 with a p-value of 0.003 which is lower than the alpha of 0.05. This only means that there is enough evidence to reject the null hypothesis and declare that *"there is a significant difference in the perception of*

faculty on flexible learning when they are grouped according to the mode of communication with students outside online class". Communication is an important aspect of flexible learning and therefore can affect the experience and perception of faculty members. The other profile such as civil status, years in service, sex, employment status, educational attainment, ICT gadget, ownership of gadget, internet provider, LMS used, online teaching experience, and online platform all have effects but not to a significant extent [33].

Table 5. Significant difference in the perception of faculty on flexible learning

Profile of the Students	F-value	Sig.	Decision	Interpretation
College	1.071	0.493	Do not reject Ho	Not significant
Department	1.081	0.487	Do not reject Ho	Not significant
Age	1.079	0.488	Do not reject Ho	Not significant
Civil Status	0.584	0.856	Do not reject Ho	Not significant
Years in Service	1.626	0.243	Do not reject Ho	Not significant
Gender	1.81	0.194	Do not reject Ho	Not significant
Employment Status	0.543	0.884	Do not reject Ho	Not significant
Educational Attainment	0.369	0.973	Do not reject Ho	Not significant
ICT Gadget Used	1.374	0.334	Do not reject Ho	Not significant
Ownership of Gadget	0.58	0.858	Do not reject Ho	Not significant
Internet Provider	0.81	0.68	Do not reject Ho	Not significant
LMS Used	0.931	0.588	Do not reject Ho	Not significant
Amount of Time for Lesson Preparation	*3.794*	*0.028*	*Reject Ho*	*Significant*
Online Teaching Experience Before the Pandemic	1.035	0.516	Do not reject Ho	Not significant
Mode of Communication with Students Outside Online Class	*7.304*	*0.003*	*Reject Ho*	*Significant*

3.6. Ensuring quality of flexible learning in the university through its faculty and students

The FGD involved 13 student participants coming from all the different colleges of the university and 7 faculty participants coming from the servicing colleges. The deductive approach to thematic analysis was utilized and results provided eleven emergent themes for students and twelve emergent themes for faculty. For the challenges encountered the student-participants' emergent themes were poor internet connection, assessment integrity, and poor schedule while the faculty-participants' emergent themes were poor internet connection, assessment integrity, and class interaction. These themes were the main challenges that they experienced during the implementation of the flexible learning modalities [34].

In connection, the things that helped them during flexible learning raised three emergent themes for students and three for faculty. Recorded materials, communication, social media, and relationships were the themes formed by student participants while LMS, institutional support, and faculty training were themes formed by faculty participants. These are the things that helped both faculty and students during flexible learning classes [35].

When asked how they could possibly help the University in improving its quality, the student participants raised two emergent themes which are providing feedback and taking part in the evaluation process. Faculty participants, on the other hand, shared three emergent themes professional development, harmonious relationships with administration, peers, and students, and commitment to excellence [36]. The last question asked for their suggestions and recommendations. Student participants have three emergent themes which are proper implementation, student support, and faculty training while faculty participants have inclusive education, educational facilities and equipment, and student assessments.

3.7. Integration of quantitative and qualitative data analysis of the faculty and students' perception and perspectives of flexible learning

Table 6 presents the integrated themes from the quantitative and qualitative data towards the development of the proposed quality assurance framework. These integrated themes were found to be very significant in improving the quality of HyFlex learning. Three additional quality indicators were added to address the other issues of HyFlex learning, these are faculty and student profile, resource allocation, and risk management. The result of the ANOVA reveals that in students' perception, only the ownership of gadgets was found to affect their flexible learning experience while the amount of time for lesson preparation was found to be significant in the faculty's perception of flexible learning. Therefore, profiling students and faculty will help in the improvement of the implementation of HyFlex learning. The profile of students and faculty will help the colleges and the registrar in identifying whether they will succeed in a certain modality or not.

Resource allocation was added as an important part of the quality assurance process in HyFlex modality. The success of HyFlex modalities relies heavily on quality teaching and materials which necessitates an additional budget for faculty training and better online resources that students and faculty may use anytime. Embracing HyFlex will cost a lot of money but will save you more in the long run. Ensuring there is enough funding for whatever needs may arise will undoubtedly sustain HyFlex learning in HEIs [21].

The last addition to the quality indicators was risk management which is something that most educational institutions learned from the COVID-19 pandemic. Risk management in the past only focused on earthquakes and other calamities like typhoons. The pandemic showed all learning institutions the need to evaluate all possible risks inside the school or university [23], [24].

Table 6. Integrated themes derived from the quantitative and qualitative data

Quantitative The least and most-rated indicators	Qualitative Emergent themes from the FGD	Integrated theme (quality indicators)
I have a stable internet connection within and outside the campus.	Poor internet connection	Accessibility and usability
There are sufficient and appropriate tools for student assessment.	Assessment integrity	Learning assessment strategies
Teachers can assess students fairly and know the individual differences among them.		
I do not have plagiarism and cheating issues even when students are being evaluated online.		
Attendance is not being monitored in your class.	Poor schedule (implementation)	Vision and institutional leadership
I am satisfied with the student-teacher interaction during flexible teaching and learning.	Class interaction	Learning activities and learning interaction
My students may study independently anywhere because my class materials are available online anytime.	Recorded materials	Instructional materials
I use different apps and platforms to communicate with my students.	Communication	Social and student engagement
The university provides a helpdesk in case I have technical issues.	Institutional support	Support (student, faculty, and staff)
The pedagogical methods used by the teachers maintain your interest in the subject matter.	Faculty training	Course structure/learning outcomes and competencies
I provide timely feedback on my students' assignments and tasks.	Feedback and evaluation	Evaluation and feedback
I do not have issues with regard to student discipline and attitude in a flexible environment.	Harmonious relationship	Social and student engagement
I use innovative and flexible learning delivery with consideration of student capacity.	Inclusive education	Flexibility and adaptability of education/security and safety
The university's LMS and ICT resources work flexibly in different teaching and learning situations.	Educational facilities and equipment	Infrastructure, facilities, and equipment

3.8. Quality assurance framework for HyFlex learning

The proposed quality assurance framework for HyFlex will provide a structure for ensuring quality in all the different learning modalities in the university. Figure 1 presents the proposed quality assurance framework or HyFlex learning. It presents institutional frameworks such as the profile of HyFlex learning, the qualification framework, and the standards for HyFlex learning. In addition, it also presents the key objectives, strategic interventions, and the roles and responsibilities of various stakeholders.

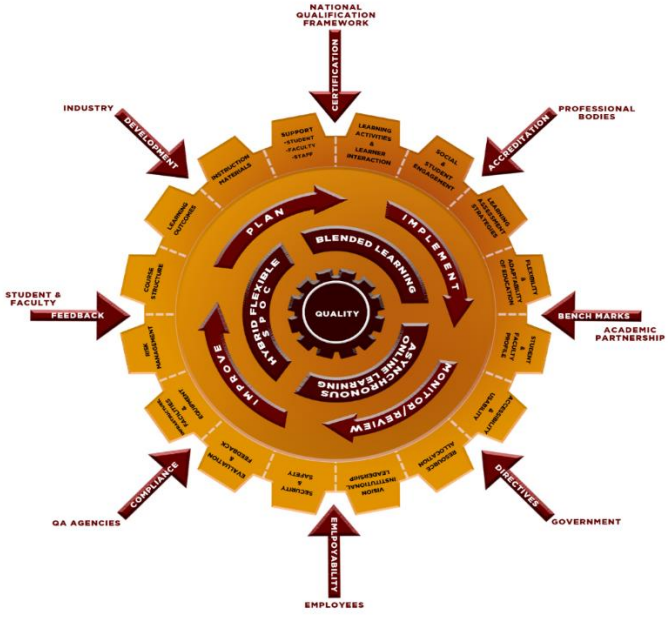

Figure 1. Proposed quality assurance framework for HyFlex learning

The framework aims to provide a transparent and reliable framework for implementing, monitoring, and evaluating quality assurance of all HyFlex learning modalities in the University. The proposed present the workpflow how HyFlex learning will be assessed and evaluated upon its implementation in the university. Thus, this will enable teaching and learning to be more effective, resulting in highly competent, ethical, and service-oriented professionals, thus contributing to improvements in the quality of higher education [24], [25].

4. CONCLUSION

Flexible learning has been very beneficial to all educational institutions, especially during the pandemic. The perceptions of students and faculty are vital in improving the quality of flexible learning modalities. Their preference for flexible learning is helpful because of its flexibility and accessibility which applies to HEIs. Therefore, ensuring the quality of the materials we are using in flexible learning is a must. Regular updating and revising of learning materials are also necessary to make the materials relevant and updated to the needs of the learners and the industries. Support to faculty and students is an important factor that positively affects their experience of flexible learning. The institutional support of providing laptops and internet allowance to faculty contributed to the success of the flexible learning modes in the university. Faculty members felt appreciated and supported, which increased their motivation and will to be better. Many students also receive tablets and cell phones that they can use for their online learning. Continuous faculty training and professional development are highly important to make flexible learning effective and relevant to the needs of the learners. Faculty training related to conducting classes in different modalities will be helpful not only for faculty but as well as for the students.

With this, it is recommended that the profiling of students into their categories will help the faculty and the University address their problems and concerns. Classifying students as regular, working, or students with special cases may be more inclusive and will make it easier for faculty members to consider them in flexible modalities. Quality assuring materials like modules, audio-visual presentations, and videos, including links of faculty members must be done regularly to ensure that materials are updated and relevant. Online links and sites must be safe and harmless. The University must create a testing center specializing in test measurement and evaluation. This office will be in charge of ensuring quality in all learning assessments and strategies in every flexible learning modality. A strong and reliable internet connection inside the University is highly recommended. The delivery of lessons in flexible learning is highly dependent on a strong internet connection and therefore must be available and accessible to all faculty and students. This will also foster open communication between and among all the members of the academic community and external stakeholders, quality agencies, etc. will help in building a quality and accessible quality education for all. The quality assurance framework for HyFlex learning be disseminated and utilized to ensure continuous quality improvement of flexible learning. A more inclusive policy and program for students with special needs and disability must be crafted. Infrastructure and facilities must likewise be improved.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest related to the conduct, authorship, or publication of this study.

INFORMED CONSENT

The authors had full documentation and obtained informed consent from the study respondents prior to their participation.

ETHICAL APPROVAL

The study was approved by the University Ethics and Review Committee prior to data collection. All procedures were conducted in accordance with ethical standards, following a strict research protocol to ensure the protection, confidentiality, and informed consent of all participants.

DATA AVAILABILITY

The data that support the findings of this study are openly available in Google Scholar and DOAJ. Moreover, the data that supports the findings of the study are from different literature and studies that can be found in Google Scholar and DOAJ.

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