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Students' flexible learning context and preferences during the COVID-19 pandemic in Albay, Philippines

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ABSTRACT

The COVID-19 pandemic has significantly disrupted education worldwide and schools used flexible learning as an alternative modality. This study used a quantitative approach and descriptive research to describe the learning context and determine the students' preferences in learning modalities, learning materials, learning tasks, and assessment techniques for flexible learning. Four hundred thirty-four (434) students from different levels in Bicol, Philippines, responded to the online survey questionnaire. The results reveal that the learners' context is inconducive for flexible learning as most do not have learning spaces and experience power interruptions and Internet disconnections. The students were provided individual or group learning tasks and experienced self-paced and interactive learning in flexible learning classes. The students reported that their learning materials, learning tasks, and assessment techniques in flexible learning include teacher-made learning resources, preference for affordable and convenient devices and applications, and usage of e-classroom or online platforms for major assessments with returned scores and feedback. Describing and identifying flexible learning conditions and students' needs were essential in creating school or community initiatives to enhance students' flexible learning experiences. The proposed initiatives can be used as strategies for future circumstances that will need flexible learning implementation.

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1. INTRODUCTION

The COVID-19 pandemic tremendously affected different sectors of the world. These different sectors, including the education sector, think of solutions to address the problems brought by the pandemic [1], [2]. During this time, safety was the foremost priority of school authorities. As a result, schools and universities switched to distance learning. This instructional delivery was suitable for preventing physical classroom interaction and virus transmission. However, the immediate implementation of the new educational approach caused its stakeholders to question effective learning [3]–[5]. Implementing a new educational approach, such as flexible learning, may support or compromise the quality of students' learning and the effectiveness of teaching practices considering it was conducted suddenly to offer an alternative instructional delivery.

The education sector welcomed flexibility in teaching and learning methods when teachers and students were advised to stay home during the pandemic. Flexibility was a way to adjust instructional delivery based on the convenience and preferences of teachers and students. The question of effective learning during the pandemic became manageable because of the adjustments offered in flexible learning modality. The flexible learning modality centers on technology usage and a pedagogical approach, allowing learning flexibility in time, place, and audience [6]. In addition, schools and institutions offered online, offline, and blended modalities to support inclusivity and accessibility of learning resources and instructional delivery. There were modifications in strategies, types of resources, content delivery, schedules, and policies to provide appropriate solutions to students' contextualized needs [7]–[9]. In this learning modality, learners could continue their studies through self-directed learning despite the lack of physical interaction with teachers and classmates. The flexible learning modality offered advantages to learners. They can learn at their own pace and time, simultaneously switch between different roles (work, study, and family), and discover skills needed to adapt successfully to new ways of learning.

Additionally, increased class interaction, collaboration, and lesson content engagement might still be present in flexible learning environments [10]–[12] if done with appropriate methods and materials. From a different point of view, flexible learning also places some students at a disadvantage. The COVID-19 pandemic brought difficulties to students, challenging educators to develop responsive practices to help students in their self-directed learning. For instance, students might feel a lack of belongingness and support, negatively impacting their academic performance. Flexible learning was indeed a great alternative approach, but for the disadvantaged, like students who do not have Internet access and affordable and convenient-to-use devices, the quality of education in online learning could be at stake [13], [14].

The advantages and disadvantages of flexible learning could happen depending on students' home environment, capability, available learning resources, and other factors. It could also be because of the immediate implementation of flexible learning which varies from school policies and teachers' lesson delivery. Previous studies show that teachers should invest their time in creating well-structured courses and differentiated learning tasks using multimedia tools to develop critical thinking and creativity in students. Teachers should regularly monitor their students by providing guidance and timely feedback on students' outputs and performances [13], [15], [16]. Well-designed learning materials for flexible learning are already greatly supporting students' learning. Good instructional delivery should also come with good communication with students by checking up on them and their academic progress. However, teachers alone cannot take all the burden of the pandemic on education. Teachers will also need assistance from other education stakeholders to implement flexible learning effectively, which can be done through maintaining partnerships with education stakeholders and identifying the current needs of students to find and design responsive and relevant methods to benefit the students [17], [18]. The mentioned studies suggest that more people, resources, time, effort, and support are needed to prepare for and implement flexible learning effectively, but during the pandemic, it pushed through regardless of the extent of school preparation.

Before the pandemic, teachers and students in the Philippines had their classes in physical classrooms. While during the pandemic, schools and universities in the Philippines immediately switched to flexible learning. Schools and universities had little to no preparation to deliver flexible learning to students [19]. Although information and communications technology (ICT) integration in classes was already present during face-to-face classes, the ICT skills of learners and teachers are essential skills for flexible learning modalities, particularly online instructional delivery [8]. Engagement in ICT-integrated lessons differs from having students in the virtual learning environment, which students might experience difficulty adapting to if they do not find their home environment conducive to flexible learning. Therefore, students' ICT skills are needed to navigate technology for learning online. The schools and universities in the Bicol region in the Philippines also implemented flexible learning modalities for students in different grade levels during the pandemic. Some schools already offered distance education before the pandemic, like Bicol University Open University, a state university in the Bicol region, to graduate students and AMA University and Colleges, a private non-sectarian institution in the Philippines, to students at different levels [20], [21]. However, most schools and universities in the country commonly had traditional face-to-face classes [22]. This finding means that flexible online learning modality was new to students and not mainstreamed in most schools. Thus, there is a need to assess students' learning context and preferences for flexible learning, which was immediately implemented as an alternative approach to education during the pandemic.

This study investigated students' learning context and preferences for flexible learning during the COVID-19 pandemic in Bicol Region, Philippines. This study involved students residing in Albay, Sorsogon, and Camarines Sur provinces in the Bicol Region. These students were enrolled in state universities or colleges (SUC), community colleges, public schools, or private schools at different levels. Specifically, this study described the learning context of the student respondents during the educational disruption and determined their preferred learning modalities, learning materials, learning tasks, and assessment techniques in flexible learning. This study explored the conditions and needs of students when flexible learning was

abruptly implemented with little preparation to craft policies and procedures for teachers and students. However, the studies that showed the disadvantages of flexible learning and the lack of preparation for implementation require attention and action to offer quality education in flexible learning environments. Thus, our study demonstrates that describing the conditions and identifying the needs of students can be used to create school or community initiatives like the establishment of community learning areas for online learning, training of teachers and students, improvement of facilities and technology resources, designing interactive assessments, and inclusion of flexible learning specialists for content quality and teacher assistants for monitoring students and assisting teachers in their workloads. These proposed initiatives are suggestions to improve flexible learning environments and enhance students' learning experiences.

2. METHOD

2.1. Research design

This research used the quantitative approach and descriptive research, using an online survey questionnaire [23], [24]. A quantitative approach and a descriptive method were appropriate for this study to collect statistical data from random student respondents [25], [26]. The respondents were selected using convenience sampling since the pandemic restricted the researcher from reaching out to respondents physically. However, this study was limited to participants willing to participate, making the respondents not well represented enough, leading to a sample bias [27], [28]. The quantifiable data underwent statistical analysis to conclude the learner context and preferences for flexible learning [23], [25]. In this study, the statistical results gathered from student respondents determined the status of flexible learning in terms of learning context, learning modalities, learning materials, learning tasks, and assessment techniques during the pandemic. The significant findings of this study are utilized to recommend conducive environments for flexible learning.

2.2. Respondents

This study focused on the implementation of flexible learning in the Bicol region of the Philippines. A link to the online questionnaire in Google Forms was posted on the research team's Facebook accounts and was also shared with the target respondents through Messenger and email from April 12, 2021 to May 26, 2021. Based on the gathered data, there were only respondents from the provinces of Albay, Sorsogon, and Camarines Sur out of the six provinces in the Bicol region. The respondents consisted of 434 students from various types of schools. As presented in Table 1, most respondents were enrolled in SUC and public schools, aged 20 to 23 years old, and female.

Table 1. The respondents of the study (n=434)

School or university	*f*	%	Age	*f*	%	Sex	*f*	%
SUC	270	62.21	19 years old and below	63	14.52	Male	100	23.04
Community colleges	5	1.15	20 to 23 years old	356	82.03	Female	334	76.96
Public schools	155	35.71	24 years old and above	15	3.46			
Private schools	4	0.92						
Total	434	100		434	100		434	100

2.3. Data gathering tools, data sources, and statistical analysis

This study used a digital data-gathering method, such as a validated online questionnaire using Google Forms. The online questionnaire was designed using as the main reference the "Handbook on facilitating flexible learning during educational disruption: the Chinese experience in maintaining undisrupted learning in COVID-19 outbreak" by Huang *et al.* [29]. The questionnaire includes two parts: personal details and flexible learning experiences covering: i) learning context; ii) preferred learning modalities; and iii) preferred learning materials, learning tasks, and assessment techniques. It consists of multiple-choice items (single and multiple responses) and a five-point scale type of item. Five teacher researchers validated the data-gathering tool, while three teachers conducted its walkthrough in Google Forms. Then, pilot testing was conducted with 30 students and the tool was revised before disseminating to the target respondents.

Before gathering data, the researchers provided an informed consent form to notify the respondents of the purpose of this study and the usage and confidentiality of their data. The Google Forms survey questionnaire publicly posted on Facebook was used to gather data from the respondents. Also, the link to the Google Forms was sent to the target respondents through Messenger and email and was shared with groups or individuals identified as students based on their publicly available social media details. The students' responses to the survey questionnaire served as this study's primary data source. The collected responses were

tallied and used descriptive statistics including frequency count, percentage, rank, and weighted mean. It was then analyzed by describing and interpreting the data and summarizing significant findings in the results [30].

3. RESULTS AND DISCUSSION

3.1. Learning context

Students attend their classes remotely at home due to the pandemic restrictions imposed in the country. Results shown in Table 2 reveal that among the given venue options for synchronous classes, most students attend their synchronous classes in a shared area at their homes, which accounts for 72.58% of the responses, followed by students using their rooms or bedrooms as venues for their classes at 22.81%. The results reveal that the majority of the students do not have their own learning spaces to attend their synchronous classes at home, and their flexible learning environment may not be conducive to learning.

Table 2. Learning context of students in flexible learning

Indicators	*f*	%	Rank
Venue for synchronous classes in flexible learning			
a. At home, in my room or bedroom	99	22.81	2
b. At home, in a shared area in the house	315	72.58	1
c. In a room designed as my work area at home	20	4.61	3
Total	434	100.00	
Schedule for the synchronous classes in flexible learning			
a. During the specific official schedule	52	11.98	3
b. During the time scheduled by the teacher, provided that the students are informed and are available	101	23.27	2
c. Both, depending on the situation or when an adjustment of schedule is needed due to power interruption or Internet disconnection as notified by the teacher	281	64.75	1
Total	434	100.00	
Schedule for the asynchronous classes in flexible learning			
a. The exact schedule as the official schedule when synchronous is not conducted	311	71.66	1
b. Any time and any day, provided that this is done at least weekly	85	19.59	2
c. Anytime and any day within the grading period or academic term	38	8.76	3
Total	434	100.00	
Course or subject content delivered in flexible learning			
a. The complete course content as shown by the course syllabus or curriculum	177	40.78	1
b. The identified content is based on the Most Essential Learning Competencies (MELC) or previously identified or approved outcomes.	92	21.20	3
c. The course content is shown by the course syllabus or curriculum but only up to the part that can be covered by the grading period or academic term	165	38.02	2
Total	434	100.00	

Ways of handling flexible learning classes	Yes		No	
	f	%	*f*	%
a. Do you have differentiated learning in your class?	339	78.11	95	21.89
b. Are you allowed to choose learning tasks from among the given options?	322	74.19	112	25.81
c. Are you allowed to choose assessment tasks or requirements?	228	52.53	206	47.47
d. Are you allowed to negotiate on the number and type of requirements?	339	78.11	95	21.89

In flexible learning, students may or may not have flexible schedules for synchronous classes. As shown in Table 2, most students attend synchronous classes on an adjustable schedule, depending on situations such as power interruption and Internet disconnection, as notified by the teacher (64.75%). Some had their synchronous class schedule set by the teacher, given that they were informed and available (23.27%), while others attended their synchronous classes during the specified official schedule (11.98%). The findings show that synchronous classes tend to be scheduled when the class cannot be disrupted by external factors (e.g., power interruptions and unstable internet connection).

Apart from synchronous classes, students also attend their asynchronous classes in flexible learning. In asynchronous classes, students have the freedom to learn and accomplish their tasks at their own pace. Table 2 shows that the students preferred to attend asynchronous classes during the official class schedule (71.66%). Asynchronous classes during any time and day, at least done weekly (19.59%) and within the grading period or academic term, are generally uncommon, especially the latter (8.76%). These findings imply that students prefer following their official class schedule for asynchronous classes, even if they do not have to, as they may already have adopted a specific routine for managing their online academic tasks.

The academic outputs accomplished by students demonstrate their learning of the lesson content from synchronous or asynchronous classes. When teachers provide instructional delivery to students, the content should reflect the objectives and learning tasks in the curriculum guides or syllabi. In flexible learning, schools adjust their content and might discuss only the contents of the determined essential learning

outcomes. Table 2 reveals that among the three options, the students' top preference for content delivered in flexible learning is the complete course content, as shown by the course syllabus or curriculum at 40.78%. Following closely as the second-top choice is the partial course content demonstrated by the syllabus, but only up to the part that can be covered by the grading period or academic term (38.02%). The least preferred choice was the identified content based on the most essential learning competencies or outcomes (21.20%). This finding means students preferred to be knowledgeable about the details of the course content by referring to the course syllabus or curriculum, either covered in the academic term or not.

From knowing what academic content was delivered in flexible learning, the delivery of learning tasks should not be overlooked in determining students' context for flexible learning. In Table 2, the students agree to all four questions about how their classes were handled in flexible learning. Of the four questions, both those about using differentiated learning and allowing negotiation on the number and type of requirements yielded top results of agreement (78.11%), while the question on whether learners are allowed to choose learning tasks from among the given options followed close at 74.19%. However, the students are almost equally divided when asked if they can select assessment tasks or requirements, with the agreeing party only 52.53% and 47.47% for those who disagreed. Based on these results, most classes in flexible learning used differentiated tasks that allowed negotiation with the teacher regarding the number and type of requirements.

Based on the mentioned findings, most students do not have learning spaces at home to attend synchronous classes. They usually had their synchronous classes in an agreed schedule where they could not be interrupted by external factors such as power interruptions and unstable Internet connection. For asynchronous classes, they follow the official class schedule to work on their self-paced tasks. Regarding course content, students preferred to know the course details by referring to the course syllabus or curriculum that could be covered or not in the academic term. Additionally, most teachers in flexible learning classes delivered instruction through differentiated tasks and allowed discussion with the students about the number and type of requirements to be submitted.

A conducive learning environment contributes to students' academic performance. Before the pandemic, teachers enhanced physical classrooms by fostering a mastery climate to support students' motivation [31] and promote learning and improvement. However, classrooms shifted into house rooms for flexible learning during the pandemic. Brachtl *et al*. [32] found that students feel less stressed and have higher well-being in a good indoor environment (e.g., well-ventilated and good interior design). Moreover, they added that students' motivation is associated with the learning area and their available resources. Student learning resources for flexible learning include a power supply and an Internet connection. Unfortunately, students in the present study reported they experienced power interruptions and Internet disconnections which were common reasons to re-schedule students' synchronous classes. These encountered challenges in internet connection [33], and power interruptions might impact online learning experiences. Students might not keep their learning pace if external factors disrupt them. This study did not explore the characteristics of students' home environment, but Brachtl *et al*. [32] study suggests that having good learning conditions, such as having well-functioning resources, noise and distraction-free environments, spacious areas, and ergonomic furniture, contributes to quality learning experiences.

Looking at the correlation between learning environment and students' qualities, Keskin and Yurdugül [34] showed that students' learning environment preferences correlate with self-efficacy, motivation, and task value. Also, students' experiences in flexible learning developed their persistence in adapting to the new learning environment, and their persistence contributed to achieving objectives [35]. This finding is also supported by Fitria *et al.* [36], who claimed that the learning environment impacts learner's motivation and academic achievement. The mentioned good conditions and traits are ideal for students taking synchronous and asynchronous classes during the pandemic. The findings suggest that students' home learning spaces should be conducive to learning despite not being physically supervised and assisted by teachers. Students and their families can make conducive spaces by designating or fixing students' learning areas at home. If this does not apply to students, considering their house size, schools should improve their facilities and offer spaces for learning. Community leaders may also establish a community online learning area to cater to more students needing conducive online learning environments. It was good to note that differentiated instruction was provided in flexible learning. This finding implies that teachers fostered an inclusive classroom, which benefits students' well-being and academic performance [16]. Moreover, flexible learning classes practiced democratic classrooms by discussing with the students the assessment forms they prefer that align with the learning objectives. These findings reveal that flexible learning is student-centered by considering their capabilities.

In asynchronous learning, students can learn at their own pace; thus, they can select the time and place where they will answer their activities [37]. In the present study, most students preferred attending to their asynchronous tasks during the official schedule. This finding implies that they already allocated time for the activities per subject by having a learning routine. They were also provided with the course syllabus or

curriculum where they could look at the topics and the possible learning tasks that can or cannot be covered during the academic term. If the topics cannot be covered in the academic term, students can still refer to the course syllabus or curriculum to further research and study the topics.

3.2. Learning modalities

Flexible learning can be delivered in either synchronous or asynchronous modalities. This section presents how flexible learning modalities were conducted, including the frequency of teaching and learning strategies used and the individual and group learning methods. Most students used the modality asynchronous online using social media and Google Apps (74.65%), and 71.20% used synchronous classes. This result is followed by an asynchronous online modality using digital materials such as PPT, PDFs, videos, and others but no social media or Google Apps, only email (57.83%), and asynchronous offline by providing modules or hardcopy materials sent to parents or learners or picked up by parents or other representatives of the family (11.06%). The findings show that most students were learning at their own pace using various online platforms and engaged in virtual classroom lectures or discussions in flexible learning during the pandemic.

Moreover, almost all the options were applicable for online synchronous and asynchronous instruction. In synchronous instruction, online real-time interactive teaching (100%) is more applicable than live-streaming teaching (97%). In online asynchronous instruction, online cooperative learning guided by a teacher is more applicable than online self-regulated learning with real-time interactive question and answer (99.77%). This finding implies that students mostly experienced online learning through interaction with and the assistance of the teachers. In addition, the frequency of the online learning forms is presented in Table 3. Online real-time interactive teaching (3.70) is more often used for synchronous instruction than live-streaming teaching (3.15). In asynchronous instruction, online cooperative learning guided by a teacher (3.89) shows higher usage than online self-regulated learning with real-time question and answer (3.64). The results on learning modalities supported the frequency usage of the online learning forms, showing the most frequency in interactive synchronous and assisted asynchronous instructions.

Table 3. Frequency usage of teaching and learning forms and strategies in flexible learning

Indicators	Always (5)	Often (4)	Sometimes (3)	Rarely (2)	Never (1)	w. $\bar{x}$	Interpretation
Frequency usage of different online forms of flexible learning:							
a. Synchronous instruction (live streaming teaching)	34	125	187	63	12	3.15	Sometimes
b. Synchronous instruction (online real-time interactive teaching)	72	181	161	19	1	3.70	Often
c. Asynchronous instruction (online self-regulated learning with real-time question and answer)	75	166	160	29	3	3.64	Often
d. Asynchronous instruction (online cooperative learning guided by a teacher)	118	174	120	21	1	3.89	Often
Frequency usage of different teaching and learning strategies in flexible learning:							
a. Lectures or direct instruction with presentations and videos	121	169	124	18	1	3.89	Often
b. Lectures or direct instruction with PDFs or Word handouts	204	146	76	7	0	4.25	Always
c. Lectures or direct instruction without presentations or videos, and PDFs or Word handouts	48	83	112	100	70	2.71	Sometimes
d. Lectures or direct instruction without instructional materials	27	62	96	107	119	2.31	Rarely
e. Case study	49	58	95	110	109	2.51	Rarely
f. Debate	6	24	62	118	167	1.65	Never
g. Discussion led by the teacher	142	179	86	19	5	3.98	Often
h. Discussion led by a student or group of students	27	139	181	65	16	3.18	Sometimes
i. Discussion by a group	34	141	166	67	19	3.19	Sometimes
j. Student-led discovery	31	92	140	91	54	2.72	Sometimes
k. Experiential learning	25	92	131	93	67	2.62	Sometimes
l. Academic games or competitions	6	55	99	143	93	2.13	Rarely
m. Brainstorming	96	143	114	53	19	3.50	Often
n. Drill and practice	32	100	135	81	41	2.69	Sometimes

Legend: always-5.0 to 4.2; often-4.19 to 3.4; sometimes-3.39 to 2.6; rarely-2.59 to 1.8; and never-1.79 to 1.0.

During the sudden shift to flexible learning during the pandemic, teachers might use different teaching and learning strategies to adapt to the new modality. Table 3 further reveals the different teaching

and learning strategies used and their frequency usage for flexible learning classes. When it comes to lectures and direct instruction, the students always used those with PDFs and Word handouts (4.25) as compared to those with presentations and videos (3.89) and lectures and direct instruction without presentations, videos, PDFs and Word handouts with a weighted mean of only 2.71. Students also reported that teachers rarely use lectures and direct instructions without instructional materials (2.31). PDFs and MS Word handouts were more frequently used for lectures and direct instruction as students' reference.

It was also found in Table 3 that discussions led by the teacher (3.98) are often used by the students together with brainstorming, with a weighted mean of 3.50. Then, it was followed by a discussion led by a group and a discussion led by a student or group of students with weighted means of 3.19 and 3.18, consecutively. Student-led discovery has a weighted mean of 2.72, higher than experiential learning, which has 2.62. Drill and practice are sometimes used (2.69), while case studies (2.51) and academic games or competitions (2.13) are rarely used. On the other hand, the debate has the lowest mean of 1.65, which implies that students rarely use it. The results mean that teachers facilitated students' learning through discussions and brainstorming, but conducting class competitions such as academic games and debates was least used for flexible learning.

In addition to the teaching and learning strategies for flexible learning, students agreed that self-regulated learning or independent learning methods were mostly applicable to them. Self-regulated learning based on video-on-demand or live streaming and autonomous and exploratory learning based on learning resources were applicable to 99.54% of the student respondents, while self-regulated learning based on disciplinary tools was applicable to 99.31% of the students. This finding reveals that most students experience individual learning methods or learn by themselves using video-on-demand, live streaming, and different learning resources. In terms of group methods, all student respondents used online collaborative learning tools for group collaboration. Group discussion in social media or online forums is more applicable to students under study (99.77%) than inquiry learning based on a project or topic (99.54%). The results mean that students experienced group learning methods in their flexible learning classes using online tools, including social media apps, to collaborate and discuss their tasks. In Table 3, class competitions were least implemented in online classes. The findings on group learning methods can explain this, as students revealed that their online tasks were collaborative rather than competitive.

The findings in Section 3.2. suggest that most students were self-paced and had interactive learning for synchronous and asynchronous online classes. Teachers also acted as guides or facilitators of students' online learning. In synchronous sessions, PDFs and Word handouts were used as additional resources for instructional delivery. Moreover, discussions, brainstorming, individual learning tasks using videos and other resources, and group collaborative tasks using online tools were the methods used for flexible learning. According to Nehme [38], the teacher and the students are at a distance in an online synchronous venue. They meet online through the use of a video conferencing app. They only need a computer or cellphone and a stable Internet connection. In asynchronous learning, students interact with the learning materials provided by their teachers [4]. This study also revealed that flexible learning combined synchronous and asynchronous modalities by conducting live lectures with provided handouts. Teachers also allowed individual and collaborative learning methods in different modalities for flexible learning. For novice learners, self-paced learning might be challenging, and to address their learning difficulties, collaborative strategies will help them gain ideas, insights, and clarification from their classmates [39]. Online learning is a type of education system that allows students to participate in classes from practically any place by accessing the digital classroom using an Internet connection and digital technologies. These practices resumed educational delivery despite the pandemic restrictions.

Flexible learning also promotes more student independence in learning and the teachers deliver instruction through technology, unlike in traditional classrooms where instruction is ICT-assisted. Studying and promoting flexible learning in schools as an alternative modality should be continuous. Schools should learn from previous flexible learning options and select which will suit their needs or problems [40]. Schools should be proactive by anticipating unexpected scenarios, like the pandemic and challenges in the future that will require flexibility in teaching and learning to be prepared to maintain quality education provision. With this conclusion, it is suggested that schools designate flexible learning specialists to manage the flexible learning modality implementation, including the content quality in modules or handouts, criteria for flexible class activities, and flexible learning procedures to meet the needs of both teachers and students when flexible learning modality is again conducted suddenly.

3.3. Learning materials, learning tasks, and assessment techniques of the students

Aside from learning context and learning modalities in flexible learning classes, this study also determined the learning materials, learning tasks, and assessment techniques provided to students. Moreover, this section also includes students' preferred software and hardware tools in attending their online classes or making their outputs. As shown in Table 4, the learning materials that were always used for flexible learning

include presentations (4.56), handouts (4.41), activity sheets or worksheets (4.33), and modules prepared by teachers (4.28). Meanwhile, assessment tools and other reading texts with weighted means of 4.12 and 3.63 were often used as learning materials in class. In comparing video materials, videos of lectures or learning tasks (3.90) are more used than videos taken from the Internet (3.75). On the other hand, research reports or articles, previously completed but relevant (3.28), were sometimes used as learning materials in class. The findings suggest that the learning materials for flexible learning use multimedia resources.

Table 4. Frequency usage of learning materials in flexible classes

Learning materials	Always (5)	Often (4)	Sometimes (3)	Rarely (2)	Never (1)	w. $\bar{x}$	Interpretation
Frequency usage of different online learning materials in flexible classes:							
a. Videos of lectures or learning tasks	113	186	118	14	2	3.90	Often
b. Videos taken from Internet sources	77	201	131	21	2	3.75	Often
c. Presentations (e.g., PPT presentation)	283	116	29	5	1	4.56	Always
d. Handouts (reading texts in Word or PDF authored by teacher)	253	130	35	9	6	4.41	Always
e. Activity sheets or worksheets (in Word, PDF, or Excel authored by the teacher)	238	123	58	8	6	4.33	Always
f. Modules prepared by the teachers	239	121	45	17	8	4.28	Always
g. Assessment tools	175	164	75	14	5	4.12	Often
h. Research report or article (previously completed but relevant)	69	134	131	62	25	3.28	Sometimes
i. Other reading texts	109	140	129	37	9	3.63	Often
Frequency usage of different learning materials not taken from the Internet in flexible classes:							
a. Reference books	59	137	137	79	15	3.29	Sometimes
b. Textbook	49	129	138	82	28	3.15	Sometimes
c. Manual	45	124	133	90	30	3.06	Sometimes
d. Handouts (reading texts in Word or PDF authored by teacher)	158	148	82	31	7	3.91	Often
e. Activity sheets or worksheets (in Word, PDF, or Excel authored by the teacher)	159	146	89	26	7	3.93	Often
f. Lesson plans or lessons	122	136	118	31	17	3.66	Often
g. Modules	200	135	65	15	11	4.09	Often
h. Assessment tools	124	165	105	27	8	3.82	Often
i. Research report or article	63	116	142	77	23	3.18	Sometimes

Legend: always-5.0 to 4.2; often-4.19 to 3.4; sometimes-3.39 to 2.6; rarely-2.59 to 1.8; and never-1.79 to 1.0.

In addition to learning materials, Table 4 shows that among the learning materials that were not taken from the Internet were often modules (4.09), teacher-made activity sheets or worksheets (3.93), teacher-made handouts (3.91), assessment tools (3.82), and lesson plans or lessons (3.66). Meanwhile, reference books (3.29), research reports or articles (3.18), textbooks (3.15), and manuals (3.06) were sometimes used. The results mean that learning materials for flexible learning refer to teachers' prepared materials for the class.

The technology tools, software, and hardware are essential for flexible learning. Table 5 shows students' software tools for producing learning outputs and their frequency usage. Of the software tools presented, tools for making handouts or activity sheets in MS Word or MS Excel (4.39) were always used, followed by tools used for creating presentations like PPT or Keynote (4.22), which was also always used. Students often used software for video production (3.64), while screen capture software (3.38) was the least used among the four tools. The finding implies that MS Word, MS Excel, PowerPoint, and Keynote tools are indispensable in teaching and learning, so they were always used in online classes.

For hardware tools used in flexible learning, Table 5 shows that the majority of the students always use their phones, giving the highest rating (4.69). This finding is followed by a laptop (2.98), which students sometimes use to create outputs. The tablet or iPad (1.21) and desktop (1.53) are the least preferred. These findings imply that the majority of the students use and access their smartphones to produce learning outputs.

In attending online synchronous classes, Table 5 showed that Google Apps scored the highest (4.57) among the tools used for synchronous online learning, followed by Messenger (4.29), which was always used. Facebook (3.52) was often used, while Zoom (2.15) was rarely used. The results indicate that Google Apps and Messenger were the preferred platforms for synchronous online learning. Table 5 reveals that Facebook has the highest usage (4.54) for online asynchronous classes, which was always used. This finding was followed by Google Apps (4.09), Messenger (3.84), and Zoom (3.77), which were all often used. This finding implies that Facebook was more preferred than Google Apps, particularly Google Classroom, for online asynchronous classes.

Table 5. Frequency usage of software and hardware tools in flexible learning

Learning materials	Always (5)	Often (4)	Sometimes (3)	Rarely (2)	Never (1)	w. $\bar{x}$	Interpretation
Frequency usage of software tools for producing learning outputs in flexible learning:							
a. Tools for making presentations (PPT or Keynote)	199	150	71	9	4	4.22	Always
b. Tools for making handouts or activity sheets (MS Word or MS Excel)	246	133	38	12	4	4.39	Always
c. Screen capture software	91	127	121	58	26	3.38	Sometimes
d. Software for video production	104	153	119	40	11	3.64	Often
Frequency usage of hardware tools for producing learning outputs in flexible learning:							
a. Desktop	16	36	52	71	143	1.53	Never
b. Laptop	128	77	62	42	75	2.98	Sometimes
c. Tablet or iPad	11	24	33	45	184	1.21	Never
d. Smartphone	357	42	23	5	4	4.69	Always
Frequency usage of software tools for synchronous online flexible learning:							
a. Google Apps	316	76	27	8	2	4.57	Always
b. Zoom	44	43	67	101	140	2.15	Rarely
c. Facebook	125	101	122	58	16	3.52	Often
d. Messenger	260	83	61	22	3	4.29	Always
Frequency usage of software tools for asynchronous online flexible learning:							
a. Google Apps	227	93	69	24	15	4.09	Often
b. Zoom	156	118	101	35	13	3.77	Often
c. Facebook	292	95	41	2	3	4.54	Always
d. Messenger	172	110	88	44	13	3.84	Often

Legend: always-5.0 to 4.2; often-4.19 to 3.4; sometimes-3.39 to 2.6; rarely-2.59 to 1.8; and never-1.79 to 1.0

The type of assessment in flexible learning was also determined in this study. The results in Table 6 show that teachers often used different assessment tasks. Students reported that individual projects (4.07), essays (4.02), multiple-choice type tests (4.00), reflection papers (3.99), short-response type tests (3.84), individual performance or presentations (3.80), group projects (3.56), and group performance or presentations (3.46) were often the assessment activities of students in flexible learning. Peer assessments (3.21), portfolios or e-portfolios (2.79), and critical papers or analyses (2.75) were sometimes their assessment tasks. In contrast, the research paper type of assessment (2.39) was rarely given by teachers to students in flexible learning. The findings mean that teachers mostly preferred giving individual assessments over group assessments and laborious tasks to students in flexible learning environments.

Table 6. Assessment types used in flexible classes

Assessment types	Always (5)	Often (4)	Sometimes (3)	Rarely (2)	Never (1)	w. $\bar{x}$	Interpretation
Multiple choice type test	138	182	94	16	2	4.00	Often
Short response type of test	98	202	110	19	2	3.84	Often
Essay type of test	140	187	88	15	3	4.02	Often
Performances-individual Presentation (with documentation of the performances)	115	166	118	26	5	3.80	Often
Performances-group presentation (with documentation of the performances)	63	161	144	47	15	3.46	Often
Team or group projects	68	164	156	36	8	3.56	Often
Individual projects	165	173	71	18	2	4.07	Often
Peer assessments	45	148	146	56	25	3.21	Sometimes
Research papers	19	66	127	112	75	2.39	Rarely
Critical papers or analysis	33	97	128	101	53	2.75	Sometimes
Reflection papers	150	160	97	23	3	3.99	Often
Portfolio (e-portfolio)	30	91	161	85	44	2.79	Sometimes

Legend: always-5.0 to 4.2; often-4.19 to 3.4; sometimes-3.39 to 2.6; rarely-2.59 to 1.8; and never-1.79 to 1.0

Overall, this section reveals that learning materials for flexible learning were mostly teacher-made using multimedia. When students had learning tasks, the majority of the students always used their smartphones to create learning outputs in applications or software for documents, spreadsheets, and presentations. In attending synchronous and asynchronous classes, students commonly use Google Apps, Messenger, and Facebook to communicate with each other or interact with the learning resources. Regarding taking major assessments in flexible learning, students reported that they had an agreement with the teacher concerning the schedule. The assessments were usually individual rather than group tasks delivered through an

e-classroom or an online platform. Student outputs were returned, scored, and given feedback by the teachers. These were the learning materials, tasks, and assessment techniques for flexible learning during the pandemic.

Different technologies should be employed to create an avenue for class participation [12], especially for flexible online classes. Thus, teachers use technology to prepare learning tasks or assessments appropriate to student needs. It was found that teachers used multimedia for instruction, which is a good teaching practice for online learning since students have different learning styles and characteristics [35]. A lesson delivery based on learning styles can increase student engagement in online classes [41]. Also, this study reveals that teachers used self-created instructional materials more than ready-made resources. Due to the demands of the pandemic, teachers prepare their materials considering students' preferences. With teacher-made materials, teachers can adjust the difficulty or complexity of their instructional materials [42], [43], and make them comprehensible or challenging to learners, depending on the student's cognitive needs.

Flexible learning also requires students and teachers to access technology tools like Google Meet, Google Classroom, Messenger, and Facebook to interact and communicate for class activities. Microsoft applications were commonly used in creating learning outputs as they are easy to navigate [44]. However, students and teachers who may not be knowledgeable about using the mentioned technology tools will need to adapt to the new situation [45], [46]. Hence, schools should train teachers and students to use online or offline applications and software to implement flexible learning effectively. In terms of devices used to access technology tools, students in the present study preferred smartphones, which is similar to the different studies reported by [5], [47]–[49]. Smartphones can be brought anywhere and are more affordable than laptops or tablets. It can even be used as a hotspot using a data Internet connection, creating a mini cell site. Using this feature, other students can connect their laptops, computers, or other devices via Wi-Fi produced by the hotspot to do their schoolwork and synchronous classes online.

Regarding online applications, Facebook was commonly used for synchronous and asynchronous learning. Facebook is a social media application that became an academic platform during the pandemic. On Facebook, retrieving and sharing content with the class for online learning was easy. Students were also familiar with its features even before the pandemic, making it accessible and convenient [50]. Recorded video lessons can be accessed through the Facebook account of the teacher. Facebook has groups and rooms where teachers can give the link or upload the recorded video of their lessons. In Google Apps, students can find YouTube. It is also possible that if the teacher has a YouTube channel, the teacher may upload his recorded video on his YouTube channel. Facebook and Messenger are free online applications that can also be used using the free data feature. Google Meet also had less data storage consumption compared to Zoom, making Google Meet more preferable for online learning compared to Zoom [51]. The findings imply that applications commonly used before the pandemic were also widely used for educational purposes during the pandemic for synchronous and asynchronous classes. These applications were free of payment, had less consumption of data storage, and were easy to use, making them preferable for online learning. However, there is still a need to improve technology resource provision as students commonly use their smartphones. Smartphones have small screens for navigating applications. It would be better if students were given laptops or tablets to access different applications more conveniently.

Shifting to online teaching and learning changes how assessment takes place [52]. Technology, like e-classrooms and online platforms, was used by teachers to deliver assessments. It was a challenge for teachers to administer assessments, particularly in assessing practical and technical skills and practicum with the limitations of physical interactions [14]. Previous assessment approaches that relied heavily on traditional face-to-face examination, which is undoubtedly effective in assessing the level of students' mastery, are confronted by their impracticality during this period [52]. Thus, alternative assessment task options, like individual or group outputs in written or performance forms, are needed to address interaction and practical skill limitations [53].

In the present study, scheduling major assessments was also a concern. Online major assessments get re-scheduled for reasons like low Internet connectivity, natural calamities, or even announced and unannounced electrical interruptions [54]. Consequently, teachers offered flexibility in the assessment schedule and asked the class for agreement on the set assessment schedule. Regarding scoring and feedback in flexible learning, the present study reveals that teachers provide remarks or feedback on student outputs. Feedback to students increases class participation, self-esteem, self-efficacy, and academic achievement. However, teachers should be cautious about their remarks because some students might feel shy and uncomfortable if mistakes or errors are shared with their classmates [55]. Teachers already have many roles in flexible online classes; therefore, teacher assistants should be available for flexible learning to help monitor students' academic progress and assist teachers with their workloads.

4. CONCLUSION

Educational institutions adopted flexible learning modalities during the COVID-19 pandemic. In this study in Bicol, Philippines, the students' learning context was described, and their preferred learning

modalities, learning materials, learning tasks, and assessment techniques for flexible learning were determined. The findings provided conclusive evidence that students' learning context for flexible learning was not a conducive learning environment. Most students did not have learning spaces at home, and their online learning was hindered by external factors such as power interruptions and Internet disconnections. Consequently, they had to re-schedule their synchronous classes at a convenient time for all students and the teacher. In asynchronous classes, students preferred to learn or to do their asynchronous tasks during the official subject schedule. A course syllabus or curriculum was also a helpful reference for knowing more course details. A democratic and inclusive classroom was fostered in online classes as the teacher provided differentiated tasks and allowed discussion of requirements with students. Flexible learning modality offered self-paced and interactive learning in online synchronous and asynchronous classes. Teachers continued to act as facilitators of learning by providing individual and group activities that require engagement with learning materials. Teachers prepared their teaching-learning materials using multimedia, and students attended classes and accessed learning materials using smartphones and affordable and convenient applications or software. The teachers scheduled major assessments upon agreement with the students, and students took their major assessments through an e-classroom or an online platform. These local realities about learners' context and preferences in flexible learning are essential for creating school and community initiatives for flexible learning.

Considering the salient results of this study, it is recommended to designate areas for studying or attending flexible learning and provide appropriate devices to improve the students' flexible learning experiences. The schools should improve the facilities to ensure safe, conducive, and inclusive learning spaces, assign flexible learning specialists to design and implement effective learning management and conduct comprehensive training for teachers and students in the use of technology. Community leaders may also build a community online learning area for students who cannot afford a learning space at home. Promoting flexible learning as an alternative modality should continue to prepare for future scenarios requiring flexible learning implementation. Teachers should select alternative assessment task options to address the gaps in assessing students' mastery and application of learning. By studying the context and preferences of students in flexible learning, this study explored strategies to enhance the students' flexible learning experiences. These recommendations can address flexible learning difficulties and gaps and be adopted to create disruption-ready.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
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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

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The study was approved for implementation and has complied with the institutional policies for research of Bicol University, Philippines. Moreover, this study's data collection was conducted in accordance with the Data Privacy Act (Republic Act No. 10173) of the Republic of the Philippines.

DATA AVAILABILITY

The authors confirm that most of the data supporting the findings of this study are available within the article. Other supporting data, particularly on pages 1899, 1902, and 1903, are available from the corresponding author, [RROB], upon reasonable request. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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