

# ADAPTING SCIENCE TEACHING STRATEGIES IN RESPONSE TO THE COVID- 19 PANDEMIC

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**Abstract:** The unforeseen emergence of the global pandemic due to COVID-19 impacted different sectors of our society, including education. The immediate response of higher education institutions in the world including the Philippines, is to shift the mode of learning from traditional face-to-face (F2F) to purely online and, presently, blended learning. The study employed a qualitative approach using phenomenological research. The analysis method used is thematic analysis. The experiences of the key participants elucidated the following themes: a.) student-centered and teacher-centered strategies resulting to an overarching theme-Reflecting on past experiences, b.) resilience and innovation resulting in an overarching theme-Moving forward, and c.) online practices and F2F practices which resulted in an overarching theme-Blended learning. The pandemic fashioned the selected science faculty with a certain level of resilience and innovation in their teaching strategies during the transition, which is a reflection that the faculty and the institution as whole are willing to adapt, change, and move forward. Implications for the present educational practice, future research, and policy on blended learning are also provided.

**Keywords:** COVID-19, pandemic, science, teaching strategies

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## Introduction

As a preventive measure to combat the spread of the corona virus during the pandemic, the education sector in the country was forced to shut down, and thus, no face-to-face classes (f2f) with the students during lectures as well as laboratory and field works respectively. Additionally, as an immediate response to the situation the higher education institutions (HEI) in the country which includes the University of Mindanao embraced online distance teaching and learning as an alternative way to continue education wherein physical attendance of the faculty and students on the university campus is no longer needed especially during the series of lockdown. The country's Commission on Higher Education (CHED) issued CMO no.4 s.2022 also known as "Guidelines on the Implementation of Flexible Learning" to guide the HEIs in the country. But, as expected, the sudden shift from the traditional to online learning brought about some concerns about the impact of this experience on teaching faculty as well as the impact of this online teaching experience on future teaching practices (Cutri & Mena, 2020). Online teaching is a complex process requiring a change to the traditional roles of instructors and a shift in their beliefs, pedagogical thinking, and teaching practices (Sinacori, 2020). According to Kerres (2020), most educators with and without prior online teaching experience had to

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adjust their course requirements, teaching methods, and learning activities. Hence, as cited by Johnson *et al.* (2020), it is prudent to investigate the experiences of the faculty during the transition. Meanwhile, in the study of Johnson, N., Veletsianos, G., & Seaman, J., (2020), it was revealed that the “shift” in the mode of learning in higher education due to the pandemic has forced many educators to adopt online learning and teaching platforms and tools. Despite these concerns, few studies have investigated faculty experiences and responses during the shift from traditional to online learning (Haslam, C.R., Madsen, S., & Nielsen, J. A. 2020; Johnson, N., Veletsianos, G., & Seaman, J., 2020). It is with this purpose in mind that this phenomenological inquiry was conducted to investigate the teaching strategies of the selected science faculty of the university during the mandated shift from traditional f2f classes to online teaching in response to the pandemic.

This present study is anchored on the System theory which sees higher education institutions as being part of the system as an adaptive system since it interacts between the external environments and the system’s sub-parts and the sub-parts themselves. Applying the principle also imply that all systems like higher education institutions to possess certain qualities such as openness, adaptability, stability, and flexibility. Additionally, the Systems theory also considers higher education institutions as an open organizational system that adapts according to changes in the environment. The emergence of the COVID-19 pandemic changed the education sector in many ways. The global pandemic acted as a stimulus in the field of education to shift the mode of learning from traditional f2f to online teaching. Presently, the university has transitioned anew into the blended learning which is an integration of both f2f and online education modalities. Previous evidence suggests that the hybrid or blended learning can offer creative options to academic leaders and faculty, making information available to students outside the classroom. Also, hybrid or blended learning can help in optimizing and maximizing student’s productivity during in-person sessions (Powell, *et al.*, 2015).

On a global scale, the findings of the study can contribute additional knowledge to the existing studies about faculty responses during the transition. This present study also aligns with the United Nation Sustainable Development Goal (UN SDG) 4 which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Meanwhile, on the part of the university, findings of this study will help the top management understand the teaching experiences of the selected science faculty during the transition. It is anticipated that the experiences of the faculty will serve as the basis when the management re-visit the existing programs and policy on instruction and faculty development respectively. While on the part of the faculty, the lived teaching experiences of the key participants during the transition will certainly serve as a basis for the present faculty of the math and

science department to implement practical resilient teaching strategies given the current circumstance and that the faculty will learn from each other's experiences.

This present study primarily aimed to investigate the teaching strategies of selected science faculty during the transition. Specifically, it sought to answer the question: What are the teaching strategies of the key participant before the pandemic? during pandemic?

## **Methods**

### ***Participants***

Purposive sampling was used in choosing the six (6) participants. All the participants are full time science faculty during the transition who are handling science subjects with lecture and laboratory components under the BS Biology program of the University of Mindanao. In addition, all the participants have been in the university for more than five years in service. Furthermore, the selected faculty had undergone some training regarding the use of a learning management system (LMS) to support their f2f classes before and during the pandemic. According to Noon (2018), smaller samples are commonly utilized in phenomenological research which requires intensive, immersive, and deep exploration of individual cases that hold relevance and personal significance to participants. On the other hand, Cresswell (2009) mentioned that in conducting qualitative interviews, the researcher can conduct face-to-face interviews with six to eight interviewees. Thus, selecting six (6) key participants is already deemed sufficient for this study.

### ***Instrument***

A semi-structured researcher-made interview guide was used in the conduct of this study. There is only one major question: What are the teaching strategies of the selected science faculty during the transition? Following the methods of Noon (2018), additional probing questions were also asked during the f2f interview to allow the researcher to have a deeper exploration of participants' teaching strategies during the transition. Example questions are the following: 1. What are the technology (tools/gadgets) that you used during the transition? and 2.) Were you active in using LMS during the transition?

Furthermore, actual interview was personally conducted by the researcher to explain to the key participants the purpose of the study and to establish rapport with the key participants. This process would also allow the researcher to put into writing the information shared just in case the key participant would not want the interview to be recorded. Cresswell (2009) posits that a qualitative interview involves a researcher asking one or more participants general, open-ended questions and recording their

answers. Through the respondent's response, the researcher will be able to identify some themes/patterns that will help in "making sense" of the phenomenon under study.

### ***Design***

This present study employed a qualitative approach using phenomenological research since the study required a detailed understanding of a central phenomenon which is the teaching methods/strategies of the selected science faculty during the transition. In addition, the study is also phenomenological because it aims to uncover individual perceptions and views under investigation. Responses from the researcher-made questions during actual interviews among the selected key participants provided mainly qualitative information. Creswell (2009) posits that phenomenological research is a strategy of inquiry in which the researcher identifies the essence of human experiences about a phenomenon as described by the key participants. Phenomena may be events, situations, experiences, and concepts that all commonly exist as part of the world in which we live

### ***Procedures***

Purposive sampling was used in choosing the key participants. However, before the researcher conducted the interview, a letter of permission to gather data duly signed by the Vice-President of the Research Center (RPC) and Dean of the College of Arts and Sciences (CASE) was secured. Once the letter was approved, the researcher then gave the selected key participants a letter of consent to participate in the study. As soon as the letter of consent was accepted, the researcher and the key participants finalized the actual date of the live interview.

### ***Data Collection***

Data collection in this study involved key participants' live interviews as the main source of data. During the interview, a researcher-made semi-structured interview guide was used. The selected key participants were asked the same questions, and their answers were collated and served as data and information about their teaching experiences during the transition. A certificate of appearance duly signed by the key participants was secured immediately after the actual interview as evidence that the researcher personally conducted the interview as scheduled in addition to the audio recordings.

### ***Data Analysis***

In analyzing and interpreting the data that were gathered in this study, thematic analysis was done on data and information that was gathered from actual interviews of the selected key participants. The

responses verbalized by the key participants were transcribed into words. The process allowed for patterns/themes to be identified and for comparison to be established with what the selected key participants said and how the concepts were understood. This study followed the approach described by Ryan and Reynolds (2003), in their tips on how to identify themes such as: (1) Repetition-which is by far the most common theme-recognition technique and is based on the premise that if a concept reoccurs throughout and/or across transcripts, it is likely a theme; (2) Constant comparison /similarities and differences-as the name implies, it involves systematically comparing sections of text and noting similarities and differences between sections. In general, the following steps were followed: a.) Reading and re-reading transcripts to obtain a general sense of the whole content, b.) Extracted significant statements for each transcript, c.) Formulated meanings based on significant statements, d.) Categorized formulated meanings, clustered, and identified emergent themes, e.) All emergent themes were defined in an exhaustive description. The result of the emergence of all the study themes creates an overarching theme, f.) Integrate the findings of the study into the description of the phenomenon studied, and g.) Validation of the findings of the study through participant feedback to complete the analysis. At this stage, the narratives of the selected key participants were returned to them for feedback if there were any. "Member checking" of the final report or themes is one of the strategies recommended by Cresswell (2009) to determine the accuracy of the qualitative findings.

### ***Ethical Consideration***

At the onset of conducting this study, ethical issues were considered immediately first by seeking the approval of the Vice-President of the Research and Publication Center (RPC) and the Dean of the College of Arts and Sciences Education (CASE) respectively to allow the researcher to gather data. Once the permission to conduct the study was approved, a letter of consent from the identified key participants was secured. The key participants were coded for confidentiality. In this study, Key Participant 1 to Key Participant 6 refers to the selected science faculty of the Math and Science Department who have actual experiences in teaching subjects under the BS Biology program of the university during the transition. Meanwhile, during the f2f interview with the selected key participants, the questions that were asked were semi-structured and prepared by the researcher. Also, the probing questions were those in relation only to the teaching experiences of the participants when it comes to their teaching strategies during the transition. The selected key participants were also informed ahead that the data and information extracted from them were solely for the purpose of gathering data and information for this study. The information collected will be kept private and will be shared only between the researcher and university research center and in reputable publications and conferences (virtual or f2f) in the future. After the actual interview, a certificate of appearance was secured from the

key participants as evidence that the researcher personally conducted the interview. Lastly, a validation certificate was likewise secured from the key participants as proof that the transcribed narratives were returned for them to check the accuracy and give feedback if there were any.

## **Results and Discussion**

The findings of this study highlighted three overarching themes: reflecting on past experiences, moving forward, and blended learning (Table 1).

**Table 1: Summary of Overarching Themes Generated in the Study.**

Formulated Meanings	Emergent themes	Overarching Themes
Learning by doing	Student-centered strategy	Reflecting on past experiences
Encouraging students to participate		
Teacher-talk	Teacher-centered strategy	
Flexible	Resilience	Moving forward
Initiative		
“Techie”	Innovativemess	
Academic requirements during pandemic	Online practices	Blended learning
LMS utilization		
Traditional teaching strategy	F2F practices	

*Theme 1. Reflecting on past experiences*

According to Foulger et al. (2019) both learning and teaching online require a shift in pedagogical thinking and practice. As expected, the unexpected shift during the pandemic has created many new experiences for higher education faculty (Johnson et al., 2020). These new experiences brought about by the pandemic refers to the changes when it comes to the teaching strategies, learning activities, and course material. These changes were mainly implemented to support student engagement and interactions with peers, instructor, and course material (Haslam et al., 2020). The lived experiences of the six (6) key participants in this present study revealed that there are indeed observed changes during the transition especially in the approach which is similar to what was pointed out by Tsedenhamba and Gungaarentsen (2022), who both cited that the change during the transition was just the approach to teaching.

Before the pandemic, as recalled by the six (6) key informants, the use of various hands-on activity during their f2f classes is a common practice. *“Before I do a lecture **and more on actual doing/ hands-on**”* (Key Participant 5). While Key Participant 3 shared that: *“Before the pandemic, I gave a **board work. The students solved the problem as part of the application. After that, I used the laboratory method where students apply their basic knowledge through the laboratory, where they can apply the concept.**”* Then, as elaborated by Key Participant 4:

*“Before the pandemic the teaching strategies for lecture or student-centered instruction where students are the ones who navigate the presentation and I as a teacher serve as facilitator. For the laboratory activity most likely of course I think everybody will do this experiential learning wherein the **students have hands-on activity during the laboratory task.** So most likely let’s say in my Dev. Bio and Parasitology. We do have our **case study.**”*

Meanwhile, during the transition, as per the experienced of the the key participants, student-centered activity was still being practiced aside from the usual teacher-centered task to encourage active interaction between teacher and students. The change during the transition was just the approach to teaching which is similar to what was pointed out by Tsedenhamba and Gungaarentsen (2022), who said that during online teaching and learning the teachers had to change their approach to teaching. As per the statement of Key Participant 6; *“During the pandemic, I ask them to **report some topics in front of their classmates so that we opt also to enhance their communication skills and confidence as well.**”* While Key Participant 3 briefly said that: *“During the pandemic, still **board work**”*. Then, according to Key Participant 5; *“I have to prepare problem sets which are **individualized problem set. One problem per student then we must show it to the online how they write the answer.**”* Moreover, two participants

revealed that their strategy is to personally conduct the lecture before giving a task to the students. As shared by Key Participant 3, “*During the pandemic, what I do is I give my lecture using the SIM (Self-Instructional Module) then there’s a “let’s analyze” right?*” Then, as elaborated by Key Participant 5:

*“I do a lecture and for the laboratory the pre-lab. discussions, and an overview of the videos that we are going to watch which I got from YouTube demonstrations. You must explain it and then afterward you do the implications. I just provide questions based on the video that we have watched.”*

Finally, Key Participant 5 emphasized that; “*Before and during the pandemic I conduct lectures. For the laboratory, the pre-lab. discussions, and an overview of the videos that we are going to watch which I got from YT demonstrations. You must explain it then afterward you do the implications.*”

Consistent with other research, teaching from f2f to online (Sinacori, 2020) require a shift in pedagogical thinking and practice. One impact that has been noted in literature is a shift from teaching-centered to more student-centered practices. In a phenomenological study aimed at understanding the experience of changing one’s f2f teaching practices as a result of online teaching, it was found that faculty re-designed their f2f courses by incorporating technology tools to support active learning and enhance peer and instructor interactions (Kearns, 2016). Moreover, since educational institutions nowadays are offering the online mode of learning to their students, it needs to mimic the campus delivery mode in a sense that the teaching needs to be student-centered and students need to be provided with interactive engaging materials that help them better in their learning and study goals. Because it is delivered online, the digital technologies need to be enabled and provided to the students (Tsedendamba and Gungaarentsen, 2021).

## *Theme 2. Moving forward*

The second finding of the study revealed emergent themes such as resilience and innovation which resulted in the overarching theme: Moving forward. During the transition, dry laboratory activities and recorded power point or video presentations are common teaching strategies among the six (6) participants. “*During the pandemic yes, in the laboratory I tried to implement dry laboratory activities. So, there are laboratory activities where you can just go to the field and conduct their study, for example, do activities.*” (Key Participant 1). This is supported by Key Participant 3 who elaborated that:

*“However, during online classes, we use a different kind of board work where students will solve the problem through PowerPoint presentation which will be presented in the next meeting. Before the pandemic, we performed actual laboratory activities but during the pandemic, we shifted to dry laboratories. I call it a home conceptual laboratory. They do activities at home.”*

Additionally, Key Participant 5 briefly explained: “*During pre-pandemic, you must do it in actions. I can see how groupings, but during the pandemic, they have a video to send.*”. The adjustment during the transition are the materials being used during the laboratory and the criteria during assessment. For

example, Key Participant 6 said: “Yes, Ma’am. So, in the case we have a lot of activities prior to the pandemic we must **change some of the...let’s say materials** so that the students can still use or can do experiments at their homes.” The Key Participant added further that “*Actually, for the essay Ma’am, it didn’t change but for instance **for the reporting I changed some criteria for that and changed some outputs, for example, they present their videos or presentations, add more spice to it.***”

Clearly, the selected key participants who has no prior experience of online teaching find ways and means to handle the subject assigned to them amid the pandemic. This experience supports the study of Johnson *et al.*, 2020 and Kerres, 2020, who elucidated that most instructors then, with or without prior online teaching experience, had to adjust their course requirements, teaching methods, and learning activities. Many faculty relied on self-help and collegiate support. In this study, two key participants recalled that they relied more on “self-help” initiative. According to Key Participant 6, “*In terms of lab. manuals, **I made them personally***”. Then, as explained by Key Participant 3:

*“For some laboratory activities, we don’t have the materials. What I usually do is use **alternative activities that will fit the lesson**. There are materials that I’m unfamiliar with **I usually ask experts, especially in the Engineering Department.**”*

Furthermore, during the pandemic there is heavy reliance on the use of technology. This observation supports the study of Salsabila, *et al.*, 2020 who showed that technology played an important role as a medium of interaction to facilitate the transfer of knowledge between teachers and students. Some of the social media which can be used for online learning are Google Classroom, Google Meet, Whats App, YouTube, and Zoom (Pitaloka, 2020). Meanwhile, as reflected in the narratives of the three (3) key participants, they all said that online sources and social media platforms became a common alternative source of information during the pandemic. As pointed out by Key Participant 5: “*It is difficult during the pandemic because there’s no hands-on. **YouTube was very helpful, especially for laboratory purposes.***” Briefly, Key Participant 6 also added that: “*Aside from the computer I was able to use my phones, the smartphone, to access the **LMS or blackboard.***” and lastly, as experienced by Key Participant 2; “*When I have to prepare my lessons, I have to search **Google** and at the same time watch different teaching strategies and methods online.*” These experiences of the key participants converge with the study of Boivin and Welby (2021), who observed that during the transition the teachers are forced to keep up with innovation and integrate more technology into their everyday teaching. As described by Megahed and Ghoneim (2022), combining technology with in-person lectures creates settings that can improve students’ capacity for learning.

Furthermore, the six (6) key participants disclosed that there was heavy reliance on the use of gadgets during the transition. “*For online classes, I used my **phone, my computer, and my laptop.***” (Key Participant 1) while Key Participant 3 said that “*Yes, I have a **cellphone, laptop, and pen pad.** The **pen pad** is used strictly during online classes for drawing during the discussion, I doodle there.*”

The testimonies of the key participants in the study supports the observation of Xiao (2023), that HEIs was able to transition to online learning mainly because of the availability of education technology platforms. It became a necessary tool because it deepened and broadened online teaching. Likewise, deeper understanding of online technologies in supporting student learning served as main drivers for the implementation of blended learning (Al-Freigh, 2021). The blended learning model which combines both online and offline teaching is now the mainstream teaching approach in colleges and universities since the normalization of epidemic prevention and control (Xiao, 2023). According to Zixian (2025), offline teaching under this mode emphasizes direct contact and communication between teachers and students, and uses activities like group discussion and practical skills of students. On the other hand, online instruction relies on education technology platforms, which allow students to schedule their study time in a flexible manner, constantly view instructional videos, and make their knowledge simpler. Additionally, the various online teaching platforms are holistic in their features and encompass a range of teaching functionalities, including live lectures, homework and submission of assignments, and online tests, were utilized on a large scale by educational institution as a countermeasure to the forced halt of offline learning during the special period of the pandemic. Presently, the use of online educational platforms remain central to the university system even after the pandemic, providing new avenues for gains in efficiency and digitalization.

### *Theme 3. Blended learning*

The findings of this present study revealed emergent themes namely: online practices and f2f practices therefore, the overarching theme is “Blended learning.” The blended mode of learning model integrates both the strength of online and f2f teaching. Additionally, blended mode of learning combines both the synchronous learning experiences with asynchronous offerings as well (Severino *et al.*, 2021). As practiced by the institution, f2f (synchronous) teaching under blended mode emphasizes direct contact and communication between the teachers and students, and uses “*hands-on activities*” (Key Participant 2). While online (asynchronous) teaching is mostly done through LMS. Online instruction as mentioned by Zixian (2025), rely on education technology platforms, which allow students to schedule their study time in a flexible manner, and constantly view instructional videos. As disclosed in the narratives of the six (6) key participants are the variety of teaching strategies that they practice in

their respective classes. Specifically, during online class Key Participant 2 said that: “**Posting in LMS** is actually very necessary and important, posting of all those activities.” while as experienced by Key Participant 6: “I also give exams using online platforms like our **Blackboard Learn** and I give them activities.” Also, “We make some **SIM** or modules for the students.” Meanwhile, as mentioned by Key Participant 3: “I can see that the **SIM** was effective. We were tasked to **create a SIM**. The **SIM** is complete. It’s like a book. I use it in my lecture.” Meanwhile, when asked about the LMS utilization, it was revealed during the interview that there is more time spent in the use of LMS compared during the pre-pandemic time. As per the experienced of Key Participant 5: “No, no virtual classes and no virtual activities pre-pandemic. I only post the syllabus. But during the pandemic **every day**.” Meanwhile, Key Participant 4 gave a lengthy answer:

“Before the pandemic, I only used our **LMS every Saturday** since that is our scheduled time to use it for the submission of activities and for students for checking of activities. Presently, If I open my LMS, I can **open it from morning until afternoon**. Especially during the time when we have our memo so most likely **every day**, I visit it (laughter).”

Moreover, based on the experienced of Key Participant 5: “So, they just do the same thing but there are some add-on like they make models, they have to video their work, how they do it.” While Key Participant 4 said that: “Since our subject is more on major subjects, we do have our **dry laboratory activities**. In my case, we have a **scientific writing for journal articles** or letting my students read a journal article and then they need to **critique** that, and out of critiquing they need to **make scientific paper** so most discussed.” Furthermore, when the key participants were asked some more about their teaching strategy as the institution pivoted from purely online to blended learning, Key Participant 1 noted that “we can use virtual simulations but during blended learning dry laboratory is not effective anymore. However, when it comes to requirements, “**still the same requirement Ma’am. Reflection papers, position papers, and oral presentations**.” Then, as remembered by Key Participant 3:

“Still the same. **Lecture method** before and during the pandemic. My usual requirement follows this cycle of giving a lecture on a certain topic and then I will give you a **board work** so that the board work will be the requirement.”

When asked about LMS features that are very useful during the transition, the common answer of the six (6) key participants is the assignment section where they can give exams and do discussion. Meanwhile, two (2) participants mentioned the usefulness of open forum section then, one (1) participant like the attendance section. In a nutshell, Key participants 1 and 2 respectively, cited that they like all features of the LMS.

The variety of teaching strategies as described by the key participants in this study made online teaching in the institution possible during the transition. This finding supports the observation of Rouadi and Anouti (2020) who said that online teaching failed during the pandemic in many schools however, it was successful when teachers used a variety of teaching methods, developed communication with learners, and encouraged active participation during lessons. Meanwhile, the use of technology as experienced by the key participants during transition was very useful. According to Fullan *et al.*, 2023; Karakose & Tulubas, 2024, those schools that are inclined to promote the implementation of innovative technologies are generally progressive organizations that consider technological innovation as a fundamental tool to improve educational outcomes. These schools invest not only in the equipment and software needed but also in a culture of continuous learning and adaptability.

#### *Implications to Educational Practice*

The use of self-instructional module (SIM) was very useful during the transition. It is highly encourage that every subject must have an available SIM that can be utilize by the faculty both online and f2f. On the other hand, the procedures and the materials in the existing laboratory manuals must be re-visited and revised as needed. An alternative hands-on activity (dry laboratory exercises) that can be done by the students at home must be integrated also in the manual just in case f2f class is not possible. When it comes to class scheduling and mode of learning, the synchronous and asynchronous class promotes flexibility among the faculty and students. The strength of virtual and f2f mode of learning was put into good use. Lastly, during the transition technology played a pivotal role for the smooth transition of the university from f2f to online learning. Communication with the students was more efficient if done both f2f and online. It is prudent for the university to invest more in physical facilities and IT infrastructure and software to serve better interactive teaching activities. Likewise, access to internet and technology should be readily available anywhere in the campus.

#### *Implications for Future Research*

The key participants delivered resilient teaching strategies during the transition. But no study yet if those strategies were effective. Evaluating teacher's strategies and the factors influencing their teaching pedagogy, classroom management, student engagement, and overall student outcome must be looked into. Interestingly, the pandemic became an opportunity for teachers to be creative and innovative in their teaching strategies. Support services from the university must include continued professional development designed to help teachers integrate new technologies effectively into their pedagogy. Meanwhile, the experiences of the key participants during the transition can be use as asset during their

professional development. Individual or group support strategies (ex. faculty re-tooling) must be provided annually to improve further their practices across different modes of learning.

### ***Implications to Policy***

The findings of this study as to the lived experiences of the selected key participants affirm the open system characteristics of an organization such as higher education institutions. The university as a system cannot protect or seal itself from both the internal and external forces that affect the whole system. Due to the global crisis brought about by the COVID-19 pandemic, the university must adapt to the “new normal” of teaching and learning. This study presents a different and additional knowledge on education responses to a pandemic. Meanwhile, the present policy of the country’s Commission on Higher Education on flexible learning served as an effective guide to the higher education institutions in the country in managing education during the transition. Likewise, the existing guidelines on the implementation of blended learning is worth re-visiting the experiences of the key participants in this study can served as basis in creating a new policy in the future that is designed to manage education every time we are confronted by a global crisis.

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### **Declaration of Interest Statement**

The author declares that there is no conflict of interest

## References

- Al-Freih, M. (2021). The Impact of Faculty Experience with Emergency Remote Teaching: An Interpretive Phenomenological Study. *AIFOR Journal of Education*, 9(2). <https://doi.org/10.22492/ije.9.2.01>
- Boivin, J. A., & Welby, K. (2021). Teaching Future Educators During a Global Pandemic, 9(2). <https://doi.org/10.22492/ije.9.2.02>
- Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed method approaches. 3<sup>rd</sup> edition.p.145.
- Cutri, M.R., & Mena, J. (2020). A critical reconceptualization of faculty readiness for online teaching. *Distance Education*, 41 (3), 361-380. <https://doi.org/10.1080/01587919.2020.1763167>
- Foulger, T.S., Witzel, K., & Buss, R.R. (2019). Moving toward a technology infusion approach: Considerations for teacher preparations programs. *Journal of Digital Learning in Teacher Education*, 35 (2), 79-91. <https://doi.org/10.1080/21532974.2019.1568325>
- Fullan, M., Azorin, C., Harris, A., & Jones, M. (2023). Artificial Intelligence and school leadership: Challenges, opportunities and implications. *School Leadership and Management*, 1-8. <https://doi.org/10.1080/13632434.2023.2246856>
- Haslam, C.R., Madsen, S., & Nielsen, J. A. (2020). Crisis-driven digital transformation: Examining the online university triggered by COVID-19. In *Proceedings of the ISPIM Innovation Conference-Innovating in Times of Crisis*, LUT Scientific and Expertise Publications. <https://www.forskningsdatabasen.dk/en/catalog/2596528088>
- Johnson, N., Veletsianos, G., & Seaman, J., (2020). US faculty and administrators' experiences and approaches in the early weeks of the COVID-19 pandemic. *Online Learning*, 24(2), 6-21. <https://doi.org/10.24059/olj.v24i2.2285>
- Karakose, T., & Tulubas, T. (2024). School leadership and management in the age of Artificial Intelligence (AI): Recent developments and future prospects. *Educational Process International Journal*, 13 (1). <https://doi.org/10.22521/edupij.2024.131.1>
- Kerres, M. (2020). Against all odds: Education in Germany coping with COVID-19. *Postdigital Science and Education*, pp.1-5. <https://doi.org/10.1007/s42438-020-00130-7>
- Megahed, N., & Ghoneim, E. (2022). Blended learning: the new normal for post-Covid-19 pedagogy. *International Journal of Mobile and Blended Learning (IJMBL)*, 14 (1), 1-15. <https://doi.org/10.4018/IJMBL.291980>
- Noon, E.J. (2018). Interpretative phenomenological analysis: An appropriate methodology for education research. *Journal of Perspectives in Applied Academic Service*, 6(1), 75-83. <https://doi.org/10.14297/jpaap.v6i1.304>
- Pitaloka, A. D. (2020). Pemanfaatan Sarana Prasarana dan Peran Teknologi Informasi sebagai Solusi Pembelajaran. Daring di Masa Pandemic Covid 19. *Cetta: Jurnal Ilmu pendidikan*, 3 (3).

Powell, A., Watson, J., Staley, P., Patrick, S., Horn, M., Fetzl, L. ..& Verma, S. (2015). Blending Learning: The Evolution of Online and Face-to-Face Education from 2008-2015. Promising Practices in Blended and Online Learning Series. *International association for K-12 online learning* as cited in Firmante, M. C. M. (2024). Academic and Social Adjustment to Post-Pandemic Hybrid Learning: A Phenomenological Study of Filipino First-Year Engineering Students' Experiences. *IAFOR Journal of Education*, 12(2). <https://doi.org/10.22492/ije.12.2.06>

Ryan and Reynolds (2003) as cited by Supan, M.V. (2019). Practices, challenges, and implications of homeschooling program in the Philippines: A phenomenological study. Doctoral Dissertation.

Rouadi, N. E., & Anouti, M. F. (2020). The online learning experiment in the intermediate and secondary schools in Lebanon during the coronavirus (COVID-19) crisis. *International Journal of Advanced Research in Science, Engineering and Technology*, 7(7), 14466–14485. <https://doi.org/10.1007/s12144-020-01307-w> Special Issue: COVID-19: Education Response to a Pandemic Volume 9 – Issue 2 – 2021

Salsabila, U.H., Sari, L. I, Latof, K. H., Lestari, A. P. & Ayuning, A (2020). Peran Teknologi Dalam Pembelajaran Di Masa Pandemi Covid-19, *Jurnal Al-Mutharahah: Jurnal Penelitian dan Kajian Sosial Keagamaan*, 17 (2), 188-198.

Severino, L., Petrovich, M., Mercanti-Anthony, S., & Fischer, S. (2021). Using a Design Thinking Approach for an Asynchronous Learning Platform during COVID-19, 9(2). <https://doi.org/10.22492/ije.9.2.09>

Sinacori, B. C. (2020). How nurse educators perceive the transition from the traditional classroom to the online environment: A qualitative inquiry. *Nursing Education Perspectives*, 41(1), 16–19. <https://doi.org/10.1097/01.NEP.0000000000000490>

Tsedendamba N., & Gungaarentsen O. (2022) Insights into Students' Online Learning Experiences During COVID-19 Pandemic: Shaping How We Do Education Moving Forward ISSN: 2186-5892. *The Asian Conference on Education 2021: Official Conference Proceedings* (pp.585-593). <https://doi.org/10.22492/issn.2186-5892.2022.46>

Xiao, J. (2023). Digital Transformation in top Chinese universities: An analysis of their 14<sup>th</sup> five-year development plans (2021-2025). *Asian Journal of Distance Education*, 18 (2), 186-201.

Zixian, H. (2025). The Use of Instructional Technology Platforms in the Management of Colleges and Universities: A Post-epidemic Example. *International Journal of Social Science and Education Research Studies*. 5 (4). Page 373-378.