Original Research Article

Challenges in Hybrid Teaching Amidst Pandemic: The Proposed Model

ABSTRACT

This study aimed to understand how an engineering division transforms its practices to attune to hybrid teaching pedagogy in higher education. Specifically, it aimed to identify challenges encountered by lecturers and students and how these challenges are responded to. Furthermore, it was aimed to develop a model to address problems in hybrid teaching. The study made use of a qualitative research design to gather in-depth insights about the problem and generate new ideas for research. Results of the study showed that the engineering division recognized the challenges brought by hybrid teaching like unequal opportunity among students to be engaged in class activities, inefficient support for online students, technical issues with the platform, lack of devices for online learning, additional time during the weekend, unresponsive online students, inability to monitor online students, low level of readiness and hesitation among lecturers, unstable internet connection and sound-related issues. The division responded with solutions like provision of laptops, collaborative teaching, online teaching apps, gamification, audio-visual learning, tutorial videos, use of school and personal resources, and repetition for mastery. The mechanism utilized in addressing the challenges faced are continuous professional development, informal sharing and discussion with colleagues, and institutional in-house training.

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Keywords: Hybrid Teaching, Teaching in New Normal, Engineering Education, Challenges in New Normal, Challenges of Students

1. INTRODUCTION

The importance of higher education in the development of a nation cannot be underestimated as it contributes to the economic development of a country [1]. For many, education serves as a footpath towards the economic progress of every individual and the country as a whole. Education and training are one of the pillars of the knowledge economy [2], an economy built on social values, technology, knowledge, and innovation to make knowledge products commercially viable, instead of being purely centered on production and consumption [3].

Higher education institutions (HEIs) play an important role in ensuring that university and college students acquire the knowledge, skills, and competence they need for their future profession. They utilize different resources, techniques, and methods, as well as explore alternative techniques and resources, to achieve this noble duty. However, with the advent of the coronavirus which infected the whole world, programs and activities of HEIs are now restricted. Hybrid teaching has become the trend.

For many HEIs, hybrid teaching is a new technique. This study will look into the challenges encountered by an engineering division of one HEI, and how it responded to these challenges. Understanding the experiences of this engineering division will give ideas to other HEIs on how to ensure effective learning amidst pandemics. Lecturers can adapt the practices presented in this study in their classes, as well as administrators, can use these practices as guides in the policy formulation.

Given the current situation, it is critical to gain a better understanding of students' online learning experiences during the COVID-19 pandemic. Even though many studies have looked into this topic, there is a lack of knowledge about the obstacles students face and the strategies they use and need to overcome them [4].

1.1 Statement of the Problem

This study aimed to understand how an engineering division in a Higher Educational Institution transforms its practices to attune to Hybrid Teaching. Specifically, it aimed to:

1. Identify challenges encountered by lecturers and students.

2. Examine the solutions employed by lecturers to respond to the challenges, and the rationale for these practices.

3. Explore the mechanism used in achieving the solutions used to the challenges faced in hybrid teaching

1.2 Conceptual Framework

The conceptual framework shows the interrelationship of variables in this study, focusing on theory formulation from challenges faced by both lecturers and students in an engineering division, solutions utilized to meet the challenges, and mechanisms for obtaining the solutions in hybrid teaching. The Grounded Theory, which is the study's expected outcome, is at the center of the framework. Using a grounded theory approach, this theory emerged from a pool of data on challenges faced, solutions adopted, and mechanisms utilized. The introduction section of this study is followed by a literature review, methods, results, and conclusions. The report comes to a close with a conclusion and recommendations.

Image 1: Conceptual Framework
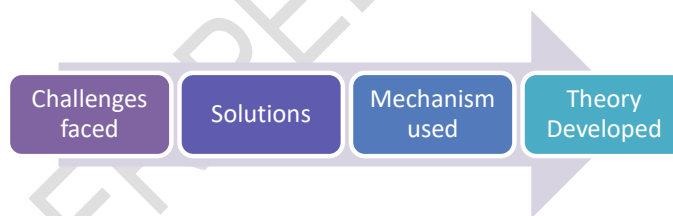
2. LITERATURE REVIEW

The COVID-19 pandemic has brought about unavoidable drastic changes in practically every aspect of daily life. This has led researchers to study the virus. Most of the studies are focused on the field of health and are published in medical journals [5]. Aside from health and economy, education is also one of the sectors that are severely impacted by the covid-19 pandemic [6].

Literature is rich with studies on the negative effects of covid-19 on the mental health of higher education students worldwide, ranging from moderate to severe. The pandemic has decreased the life satisfaction level of students who are young and athletic [7]. The majority of university students in Bangladesh are suffering from severe psychological stress symptoms [8]. The pandemic has caused increased stress and anxiety among college students in the United States [9]. Students in a university in Jordan experience moderate fear of the virus [10].

Education has become a crisis for approximately 77 million children who have been removed from classrooms for 18 months due to the pandemic. Due to the COVID 19 pandemic, schoolchildren have wasted 1.8 trillion hours and counting of physical learning [11]. As the countries are planning for school's reopening, there are hesitations for some parents to send their children to school for physical learning. In 2021, schools are starting to devise delivery of lectures in online settings, in-person learning, blended learning, and hybrid learning. In this pandemic time, schools are working on these methods with the support of the government to effectively deliver combinations of methods to achieve the learning of students [12]. The COVID 19 lockdown prompted the school to rely on digital technologies to offer classes, and universities were faced with the problem of providing quality education without jeopardizing the health of students and teachers. To that end, the Teaching Factory framework concept was used to successfully build and validate the Hybrid Model, in which engineering students assisted remotely laboratory professionals in the production and assembly of a customized remote-control car in a hybrid laboratory case study. The advantages and drawbacks of the current strategy, as well as prospects, are evaluated [13].

A year after the COVID-19 pandemic began, over half of the world's pupils are still affected by partial or complete school closures, and over 100 million additional children will fall below the minimal reading competency level as a result of the health catastrophe. UNESCO is aiding countries in mitigating the negative effects of school closures, addressing learning losses, and modifying educational systems, particularly for vulnerable and disadvantaged groups [14]. In Bahrain, all schools are preparing for the common objective in the reopening of classes for physical class delivery. The ministry of education has given the school its freedom on the choice of mode of delivery with considerations of health protocols [15].

Teachers are the most important and instrumental in education, and they make a significant contribution to long-term development, yet they are being impacted by the COVID 19 pandemic [16]. The Ministry of Education in Malaysia has proposed several steps to help students continue their education, including the use of synchronous and asynchronous online T&L. Several implementation roadblocks were discovered, including technology problems, course design, and communication effectiveness [17].

3. METHODOLOGY

3.1 Research Design

The study made use of a qualitative research design to gather in-depth insights about the problem and generate new ideas for research. Specifically, a grounded theory was implemented as a research tool that will help the researchers develop a theory that will help to explain the main concern of our study and how it will be resolved or processed [18]. In this study, a phenomenon from people's experience is aimed to develop a theory on the challenges of hybrid teaching based on the experiences of lecturers and coordinators.

The study used an interview guide with three major concerns and a series of open-ended questions. The instrument was a validated questionnaire from the unpublished research conducted by Nebrida, et.al. [19] on the challenges of a School in Teaching and Learning. However, theoretical sampling was adopted as prescribed for the grounded theory.

The respondents of the study include the head of the division and lecturers. The researchers assured that all necessary activities in the conduct of the study were properly undertaken such as sending communication letters, consent forms, scheduled interviews, and confidentiality. The data were then transcribed and reviewed for accuracy.

Theoretical sampling is a sampling used as prescribed for grounded theory. It identifies the participants which allow a theory to emerge. This type of sampling supports the conducting of interviews with an initial interview from the head of division until saturation is achieved. Theoretical sampling is a method in grounded theory studies that seek additional data based on concepts developed from initial data analysis

and following where the data have led to expand and refine the evolving theory during the analytical process [20].
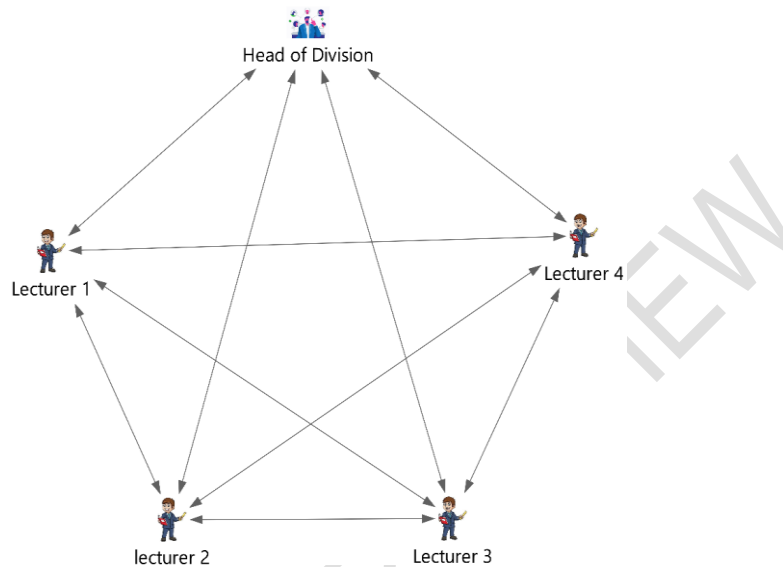

Image 2: Research design protocol

The data was gathered with an initial interview from all the participants. Before conducting the interview, a letter of request to the head of the division and the teachers who emerged in the process was made citing the details of the research. The letter of informed consent was given to the participants before conducting the interview. In the data gathering, the interview was used utilizing the MS teams application. After each interview session, the raw data were transcribed and analyzed with the use of maxQDA software. In using this software, analysis begins with coding to sort and organize data. The second step is axial coding to analyze the questions based on the initial coding made. Lastly, selective coding helps to narrow down the selected code to develop the theory.

4. RESULTS

The findings obtained from the responses of emerging participants from the initial interview with the head of division are presented according to the study's statement of the problem, which was able to identify the challenges encountered by lecturers and students and how these challenges are responded to and articulate the solution to the identified problems in Hybrid Teaching.

4.1 Challenges of HOD in Hybrid Teaching

The discussion below shows how the HOD describes the experiences in hybrid teaching which includes the challenges and general solutions used.

Challenges of the HOD. The HOD described that hybrid teaching is a call of time. It challenges everyone with issues on poor internet and some with no internet connectivity and technical issues in MS Teams. While students study at home, HEIs have continued to offer online classes and have encountered challenges with internet connectivity [21]. As the head of the department, there are issues observed like hesitation of teachers in adapting hybrid teaching, appropriate method of teachings, difficulty in engaging online learners, some learners do not have materials and computer, comprehensible materials for learners, cameras of learners are closed and more issues coming from online students. Students have

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had a lot of difficulties adjusting to the hybrid teaching model which causes a decline in motivation, technical connection issues, and less engagement with the teaching staff and other students [22].

> "Of course, many are hesitant, but since it is the call of the time because of this COVID-19, we have to accept and we have to do it. So everyone was able to adapt to this hybrid learning." (Interview with HOD, Pos. 18-22)

General Solutions to the Challenges in Hybrid Teaching. The HOD identified general solutions to the identified challenges for both students and teachers. For students, it is important to encourage them to attend onsite classes, especially for units that need practical activities. Some solutions to online students were provided using more videos for their further learning, gamification for collaborative activities, trying to motivate the learners, and lending of computers to students.

> "We have to identify the effective learning method between the e-learning and classroom. So if you are in the classroom, what learning method is most appropriate? So there can be many possibilities or many other methods. In learning, we have to identify, we have to distinguish between what method is more effective for classroom and e-learning (Interview with HOD, Pos. 110-113)

In addition, the best solution is to identify the best methods for both online and onsite students which can be achieved thru good practices of the division like the collaboration of teachers, and informal sharing of knowledge, methods, and techniques among staff.

> "Yes, that's what we had been doing. I think it had been informal, although we just had one instance where we had a meeting and we started sharing some of the techniques or methods that we had been doing." (Interview with HOD, Pos. 172-174)

4.2 Challenges of Lecturer 1 in Hybrid Teaching

The discussion below shows how lecturer 1 describes the experiences in hybrid teaching. The discussion addresses the problems with interaction for both online and onsite students, challenges of students and general solutions to the challenges in hybrid teaching.

Challenges of the Lecturer. The lecturer described that hybrid teaching demands a lot of time on the part of the teacher as the time allotted by the teacher exceeds the actual time delivery. It demands time extension for the teacher, especially in the preparation of lessons intended for both online and onsite students which in some cases the preparation is done during the weekend. Teachers' time management tactics ranged from using the internet for their teaching needs to outlining critical chores for the day to planning before classes start and working overtime at home to complete duties [23].

> "The sessions would not end with the format of the official hour, because in reality, the time I spent is more than my teaching hours." (Lecturer 1, Pos. 38)

Problems with Interaction for both online and onsite students. This is a great challenge since there is a tendency to focus on onsite students and online students may be left behind. The attention is being divided between online and onsite students. The lecturer cited that there is an effort to make an approach intended to online students address their difficulties.

In addition, the lecturer cited the difficulty of demonstrating how to use the functions of the scientific calculator to online students. There is also a challenge on the computer with the AutoCAD unit. The lecturer cited the difficulty of delivering classes for online students on units requiring practical application like AutoCAD. There are challenges such as the restrictions of learning management systems and multimedia software's basic capabilities to support online learning [24].

He mentioned that there are some online students which have issues related to the different versions of AutoCAD which causes difficulty in delivering the lessons.

Challenges of Students. The lecturer observed that there are more challenges to online students in hybrid teaching just like difficulty in using calculators, issues on different versions of AutoCAD, and understanding explanations in online settings. Managing time is also an issue for online students by which they need to rush up going to school in attending mandatory practical classes. The greatest issue of students was related to their learning environment at home, technical knowledge, and proficiency, and had the largest impact on their mental health and the quality of their learning experience [25].

General Solutions to the Challenges in Hybrid Teaching. The lecturer identified the general solutions implemented for hybrid teaching like in-house training conducted on the use of technology intended for both online and onsite students.

The lecturer stressed the significant help from the Head of Division in addressing the needed methods to the issues faced in hybrid teaching. In addition, relevant discussion and sharing of

experiences with colleagues help address similar issues faced in hybrid teaching. He also cited that, there is a need for him to have an initiative in the preparation for hybrid teaching like doing research in addressing issues of students related to calculators like coming up with guided documents with relevant images for easy understanding of students.

"We discussed with our colleagues, so based from our discussion with the head of department and colleagues, I came up and had already an idea and I tried that idea." (Lecturer 1, Pos. 164)

In addition, tutorial sessions are the best solution as mentioned by the lecturer. All students agreed to come onsite to attend tutorial classes which are in a separate schedule coinciding with some other practical activities in school.

"So the best solution is tutorial since all of them are present, we can address, uh, their problems. If they have. All of them are present on-site for that session so we can address whatever are their questions. So even for a one-hour tutorial that is already very, very significant." (Lecturer 1, Pos. 185)

4.3 Challenges of Lecturer 2 in Hybrid Teaching

The discussion below shows how the lecturer describes the experiences in hybrid teaching specifically on the challenges by lecturer and students, and solutions by the lecturer. In addition, the lecturer stressed collaboration with fellow lecturers as the best solution.

Challenges of the Lecturer. The lecturer cited that most problems faced in hybrid teaching are coming from online students, especially on issues related to using CAD applications for working drawings. In online courses, higher education is dealing with problems with an increase in student withdrawal and failure rates [26]. In addition, online students do not open their cameras, and since hybrid teaching is a new method utilized this time of the pandemic, there is a tendency that online students may be neglected, and focus is more on onsite students. This is a great challenge to engage both students in the activities for more interactive discussion. The most prominent concerns are technological issues, followed by teachers' lack of technical abilities, badly suited instructional styles to the online setting, and students' lack of connection with professors or poor communication with them [27].

"There's the first challenge that I observed on the part of me as a teacher, is engaging those students because there is a tendency of me to focus on onsite students because they are physically present" (Interview with Lecturer 2, Pos. 7)

The lecturer further cited the challenge of creating personalized videos as supplement material for students learning especially in AutoCAD applications.

Challenges of Students. The lecturer observed that there are more challenges to online students in hybrid teaching just like issues with AutoCAD software, class activities using AutoCAD, and some students are not interested in watching the personalized videos. Some online students failed to complete tasks for the day due to personal reasons like working hours conflict and invalid reasons. This is contrary to the findings of Ceylan et.al, (2021) that students believe that the most significant benefit of online studios is the use of digital technologies and that they can work efficiently even in remote education if they are given the required tools and the opportunity to develop themselves [28].

"They have difficulty, you know, that there are some issues for online students in terms of software. They say they don't have yet the software which I advised them just to bring in the computer shop and then have the software installed. (Interview with Lecturer 2, Pos. 19)

General Solutions to the Challenges in Hybrid Teaching. The lecturer identified the general solutions implemented for hybrid teaching like creating personalized videos uploaded in personal YouTube channels intended for CAD tutorials for both online and onsite students. The lecturer has to study how to create personalized videos by which love or interest in doing video is so significant. It is also significant to extend extra effort like using writing pad tool to be used in class demonstrations needed for whiteboard applications and PowerPoint presentations.

"In the previous semesters, I already have these recorded videos which guide them in manual drafting like for isometric drawing. I already have the video made in the previous semester which I uploaded in my personal YouTube channel and I shared the link with them. Also, some personalized videos which I made for example pen assignment, creating layers or some basic tools which are needed in doing the tasks of students" (Interview with Lecturer 2, Pos. 33)

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To engage both onsite and online students in the activities, onsite students should also log in to their MS team's accounts. Collaborative teaching tools were employed to achieve interactive and collaborative learning like quizziz.com, padlet, and MS forms.

> "I used the collaborative teaching tools application just like the tools that you can find on the internet. Let's say you have quizzes, you have padlet, by which I used them both for both online and onsite students." (Interview with Lecturer 2, Pos. 29-30)

In addition, the institution had regular in-house training even before the pandemic which is helpful in the technological know-how of the lecturers which is useful during this time of the pandemic.

Collaboration with fellow lecturers is the best solution. A supportive head of the department is also instrumental in coming up with good relationships among lecturers which are considered by the lecturer to be one of the best solutions in Hybrid Teaching. He stressed the significance of having a good relationship with fellow lecturers which gives way to sharing of experiences on the methods and technologies being used in class delivery. Informal collaboration shows mutual support and has the potential to boost teacher motivation and will improve teaching and learning in the classroom [29].

> "My relationship with colleagues is good. Because you know, I discuss with my colleagues our issues and then I could also learn from them in a non-formal or informal discussion. I could also learn from them the methods that they're using, which are effective in their methods of teaching. So, it's just like a sharing of experience." (Interview with Lecturer 2, Pos. 39)

4.4 Challenges of Lecturer 3 in Hybrid Teaching

The discussion below presents how the lecturer describes the experiences in hybrid teaching, with a focus on lecturer and student perceptions, as well as general solutions to the challenges in hybrid teaching. Furthermore, the lecturer emphasized video presentation as the best option.

Challenges of the Lecturer. The lecturer described poor or unstable internet connection among students attending online as one of the challenges encountered in hybrid teaching. Moreover, some students do not have personal computers, instead, they are only using cellphones.

> "Some of them don't have a personal computer, instead, they are using cell phones. Thus, they cannot use the program or software being discussed, and they cannot participate very well in the discussions". (Lecturer 3, Pos. 3-8)

The lecturer pointed out that engaging both online and onsite students is a challenge. When you are engaging hybrid students, the tendency is to focus on students onsite. Students are not turning on also their cameras and not actively participating in the discussions. The lecturer also cited that demonstrating practical tasks to students attending online is a challenge.

> "Sometimes online students are somewhat neglected. When you are in class, your focus is on the onsite students because you are physically interacting with them." (Lecturer 3, Pos. 21)
>
> "Online students cannot participate very well with the practical parts of the lesson. (Lecturer 3, Pos. 38)
>
> "We cannot see that online students are participating. We cannot see them sometimes because there are times that they will attend using audio-only, with their videos turned off. (Lecturer 3, Pos. 87)

Challenges of Students. The lecturer observed that challenges in hybrid teaching are coming mostly from online students rather than onsite students. Issues like poor or unstable internet connection, lack of personal computers, and difficulty of participating in practical tasks stem from online students.

> "There is no problem with my students attending on a face to face mode. The challenges come from students attending online." (Lecturer 3, Pos. 53)

General Solutions to the Challenges in Hybrid Teaching. The lecturer pointed out that to address the challenges, some solutions are implemented like significant videos presentations for practical activities. Students could watch the videos multiple times at any moment, they were able to progress at their own pace [30].

The lecturer pointed out that they are being encouraged by their school to use software to deliver hybrid classes. Institutions of higher education in the Gulf Cooperation Council have reputable systems

for distance education and have adequate distance learning platforms [31]. The lecturer pointed out that the identified solution was conceptualized partly from his experience in delivering online classes and partly from the suggestions of his colleagues.

"We present some videos on how to perform practical tasks. (Lecturer 3, Pos. 50).

The lecturer suggested having more workshops on using the platform and more aggressive training on hybrid teaching should be conducted.

"Our school has conducted I think only one session in using the platform. I think just a few teachers are involved in that training. Additional training to enhance the use of the platform should be conducted. (Lecturer 3, Pos. 61)

The video presentation is the best solution. The lecturer pointed out that the best solution is to have a video presentation to demonstrate practical tasks. Teaching ESP (English for specific Purposes) classes with audio-visual technologies is very advantageous for both students and teachers since the right video content may increase students' interest in the subject, keep them engaged, and help them gain confidence in their communicative language learning skills [32].

"Since they are recorded, students can have an asynchronous type of learning. They can view the videos several times to have a better grasp of the processes. (Lecturer 3, Pos. 113)

4.5 Challenges of Lecturer 4 in Hybrid Teaching

The discussion below details the lecturer's experiences in Hybrid Teaching, with repetition being the best solution to the challenges experienced.

Challenges of Lecturer. The lecturer observed that constraints in hybrid teaching are coming mostly from online students.

The lecturer pointed out that the inability to monitor online students is one of the challenges he met in hybrid teaching. "We cannot see the facial expressions of online students, thus, we have no idea if they have doubts with the topics". (Lecturer 4, Pos. 25)

The lecturer cited those technical issues, such as Internet-connection issues and Sound-related issues, pose as challenges. Network and speed issues are among the student-related challenges of online teaching during Covid-19 [33].

"Due to internet lag and other internet-connection problems, questions from the lecturer and answers given by online students are delayed. Sometimes, answers from online students are not very clear. (Lecturer 4, Pos. 10).

"Responses shared by online students are very difficult to understand. (Lecturer 4, Pos. 8)

Repetition is the best solution. The lecturer pointed out that repetition is the best solution to the challenges in hybrid teaching. One of the most common blunders a teacher can make is failing to return or repeat a lesson as the learning process involves a progressive interaction with ideas, which develops to a critical mass when the student grasps the concept [34].

"I need to ask the same question two times, first for the onsite students and second, for the online students. And I need to confirm the understanding of first the onsite students, then, followed by the online students. (Lecturer 4, Pos. 29-33)

5. DISCUSSION

The study revealed the challenges experienced by the division on the management of the department's head, as well as the different issues faced by both teachers and students. These challenges are responded to with general solutions, collaboration among staff and specific methods like personalized videos, tutorials, and repetition. A mechanism such as continual professional growth, informal knowledge sharing, and discussions, and institutional in-house training are used to identify solutions. It has been discovered that school administrators embrace digital transformation and technology-based professional development in schools as a means of fostering a digital learning culture [35]. Figure 1 showed the grounded theory that was developed to meet the challenges identified, as well as the mechanisms that were used to obtain the solutions.
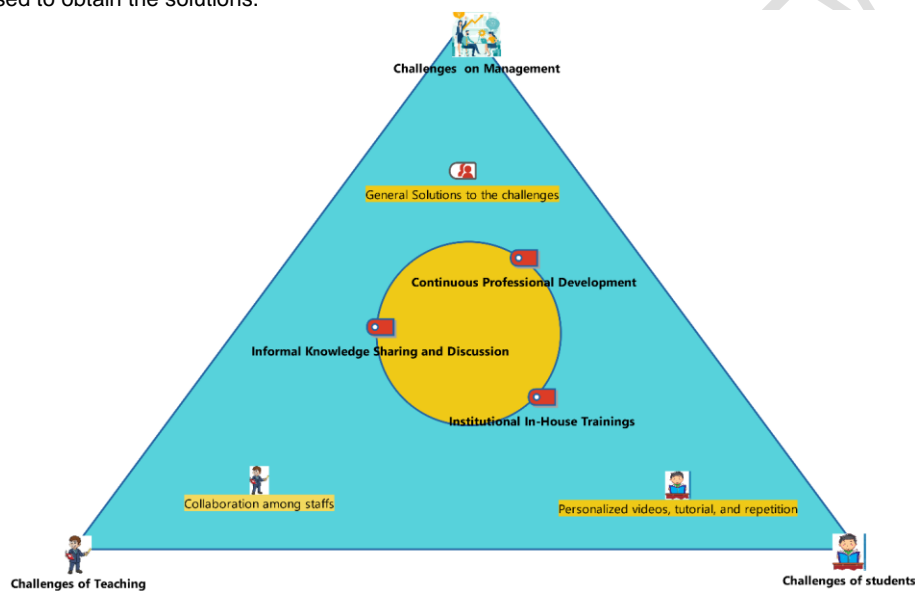

Figure 1. Grounded Theory on Challenges and Solutions in Hybrid Teaching

Challenge on Management.

The management skills of the head of division are being tested in the implementation of hybrid teaching which faces issues on teachers' hesitation in hybrid teaching, internet connectivity, technical issues in MS teams, appropriate methods of teaching, unavailability of computers for online students, and comprehensible materials for learners. The management style of the school's principal has a large positive effect on teachers' instructional competency and a moderate effect on school performance [36].

Challenges of Teaching in Hybrid mode

The challenge of achieving the expected outcome in the learning of students is indeed a real challenge in this new method of teaching. The head of division and lecturers have identified issues encountered from the onset of hybrid teachings such as a lot of time demanded in the preparation, the unequal opportunity of engagement of students in-class participation, additional time needed during the weekend, unresponsive online students, the difficulty of demonstrating practical activities like AutoCAD application and the use of a scientific calculator, inability to monitor online students, low level of readiness, technical issues, internet connection issues, and sound-related issues. In the study of Rameez et.al., the institution faced various issues in terms of online distribution, problems with practical tests administered via online mode, evaluation, examination, thesis supervision, and issues with the online

teaching and learning environment being critical to the smooth operation of the South Eastern University of Sri Lanka's teaching and learning process during the Covid-19 pandemic [37].

Challenges of Students

The division acknowledges the observed difficulties in the learning process of their students. It appears that there are a lot of challenges faced by online students compared to onsite students in a hybrid mode of teaching as observed by the lecturers. They observed the issues faced by the students such as some learners do not have materials and computers, difficulty in practical tasks like AutoCAD application and use of a scientific calculator, time management, lack of sense of responsibility, support for online students is less efficient, technical issues with the platform, lack of devices for online learning, and internet connection issues. The most common negative aspects were a distraction and reduced focus, heavy workload, problems with technology and the internet, and insufficient support from instructors and colleagues [38].

General Solutions to the Challenges in Hybrid Teaching.

The division identified general solutions to the identified challenges for both students and teachers such as encouragement and motivation, supplement videos, gamification activities, collaborative tools like pallet and quizzes for interactive activities, support from school like lending of computers to students, significant help from the head of the division, writing pad tool for class demonstrations, whiteboard applications, and simultaneous logging into MS team's accounts for both online and onsite students. Students agreed that frequent contact, summaries of essential concepts, integration of lecture content, a clear statement of objectives, and effective lecture arrangement were beneficial to learning [39].

Collaboration among staffs

All these challenges faced by the division were responded to with respective solutions collaboratively shared by the experiences among staff. The grounded theory developed shows the key characteristics that must embody to face all these challenges must start with the collaboration of the internal stakeholders that will positively affect the learning of students.

A supportive head of the department is instrumental in coming up with good relationships among lecturers which is one of the best solutions in Hybrid Teaching. The collaborative effort is evident in the observation of the lecturers of having a good relationship which gives way to sharing of experiences about teaching methods in terms of knowledge, ideas, tools, and technologies being used in hybrid teaching. Collaboration among the staff in the internal stakeholders extrudes to external stakeholders and develops good relationships is considered as the best solution [40].

Personalized videos, tutorials, and repetition

The lecturers identified tutorials and personalized videos as one of the best and most effective methods in dealing with students in a hybrid model of teaching. One method effective to some students is to deliver the lessons by repetitive activities. They also stressed the creation of personalized videos uploaded in personal YouTube channels intended for CAD tutorials for both online and onsite students. In this regard, the lecturer must study how to create personalized videos by which love or interest in doing video is so significant.

During the lesson, students appreciated the utilization of multimedia aids, fascinating photographs, clip art, and animations. Students also agreed that the lecturer was well prepared for class, encouraged active involvement, and demonstrated a strong desire to teach [41].

Mechanisms of addressing the Challenges

To address the challenges faced by the school, it is important to note the mechanisms utilized in providing solutions to respective problems.

Continuous Professional Development. Thisserves as the baseline reference for the needed solutions especially on issues of teaching methods, the trend of technology, and students related problems. The teaching methods like the use of collaborative and interactive activities are the result of self-learning and the search for continuous improvement for the education of learners. The lecturer's

effort in self-learning bridged the gap in the knowledge identification on the available trend of technologies used in education.

Informal Knowledge Sharing and Discussion. The identification of methods, tools, and technologies in the hybrid teaching of the division is greatly acknowledged from the informal knowledge sharing and discussion among the lecturers of the division. The supportive and collaborative effort of the head of division gives way to the collaboration among lecturers which in effect creates harmonious relationships and positively affects the class's delivery with the substantial and informal sharing of knowledge used.

Institutional In-house Trainings. This helps the lecturers in coping with the barriers and skills gap in this time of the pandemic. Even before the pandemic, the institution already acknowledges the need of the teachers by designing purposive training and seminars to help the teachers deliver their lessons, improve technology literacy, and update technological trends in education. The institution facilitates regular in-house training and seminar with resource speakers from lecturers of the institution on their respective specialization. This is a big help in the continuous improvement of lecturers in teaching and on the needed technology in working remotely during this time of the pandemic.

6. CONCLUSION

The study is grounded on the challenges faced by lecturers and students of the engineering division. and highlighted the mechanisms used in finding the solutions. The study used the results of maxQDA software to develop a model based on the existing practices of an engineering division. This model includes three practices that may mitigate, if not address, the challenges on hybrid teaching, namely, 1) continuous professional development, 2) informal knowledge sharing and discussion, and 3) institutional in-house training. These three practices can address challenges on hybrid teaching along with management, teaching, and students. The school must embody key characteristics to face all challenges and must start with collaboration among the staff of the division. In addition, it is also highlighted to embrace the current technology used for hybrid teaching.

The lecturers should look into practical applications through innovations in terms of methods of teaching applicable to specific groups of students, updated with the trend of technology, and embrace the love of teaching. The head of the division must be supportive of the teaching needs of the staff which results in good relations and collaboration of subordinates. Lastly, lecturers must be patient in the learning of their students and consider methods like personalized videos, tutorial sessions, and repetition for students' learning and mastery.

The qualitative method of research proves to achieve in-depth data gathering on the richness of the experience of teachers and students in finding the needed information which is grounded on the subject's teaching exposure.

Higher education lecturers can adapt the model to address the challenges they are encountering in their classes. Supervisors and administrators can also adopt the model to be implemented to the staff under them.

Since the study used a small sample, future researchers can adopt the methodology of the study using a bigger sample.

7. RECOMMENDATIONS

The following recommendations are forwarded:

Firstly, the researchers recommend the engineering division's characteristics, best practices, and mechanisms to be used in a difficult situation like this pandemic, specifically, the collaboration among staff, methods of teaching, and mechanisms in addressing the challenges.

In addition, challenges of students are encouraged for further studies.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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