Adapting to the new normal: Remote teaching challenges among educators in higher education

Maura Gina D. Ramoso¹, Ruth A. Ortega-Dela Cruz²*

¹Philippine State College of Aeronautics – Basa-Palmayo Campus, Philippines

²College of Public Affairs and Development, University of the Philippines Los Baños, Philippines

Received: September 4, 2023 Revised: September 20, 2023 Accepted: October 31, 2023

Abstract

The Covid-19 pandemic has led Higher Education Institutions (HEIs) in the Philippines to replace on-campus learning with remote teaching. This study employed a quantitative approach using online surveys to explore the challenges of 39 faculty members on remote teaching implementation in a State College in the Philippines. Findings revealed that problems related to actual delivery of instruction, access to technologies or gadgets needed for teaching, internet connectivity, additional non-teaching tasks assignment were some of the challenges faced by educators. Furthermore, the study revealed a significant relationship between some educators' demographics, and their perceived challenges of remote teaching. The results of Kendall's W revealed congruence in the perceptions of the most challenging aspects of remote teaching among educators in higher education. This pandemic is not the first, nor will it be the last, to impact the higher education system. Thus, there is a need to find ways on how educators could be able to adjust with the basic requirements for successful implementation of remote teaching. All stakeholders are enjoined to develop strategies that can be implemented in the short-term as well as long-term. A dialogue between and among members of the academic community is therefore critical in making informed policy to adapt to the new normal in higher education.

Keywords

Challenges, higher education, new normal, remote teaching.

INTRODUCTION

The Covid-19 pandemic has disrupted the education sector worldwide. It has forced millions of students and teachers to move their communication remotely. According to UNESCO [1], the educational experiences of nearly 1.4 billion students—of all ages—were disrupted. While the rapid move to remote learning during the pandemic was extremely difficult for students and learners, it was just as difficult for educators. Many of them have spent

their entire teaching profession through face-toface set up. Then suddenly they were forced to adapt to an entirely new teaching paradigm. From a pedagogical perspective, remote teaching and learning demands a shift towards more active learning methodologies. It is where the student and the educator are not physically present in a traditional classroom environment. The instruction is done through technology tools such as discussion boards, video conferencing



^{*}raortegadelacruz@up.edu.ph

platforms like Zoom, Skype, Google Meet or Microsoft Teams.

The Philippines' Commission on Higher Education (CHED) compelled the Higher Education Institutions (HEIs) in the country to switch to remote teaching and learning, which allows for time, location, and audience flexibility, including the use of technology. In response to this, HEIs implemented such a pedagogical approach which integrates learning modes that can be done synchronously, asynchronously and a combination of various modes. Synchronous online learning in which students are engaged in learning at the same time, whereas asynchronous online learning allows students to learn on their own schedule [2].

Despite the benefits it offers to both teacher and students, however, this shift to remote teaching does not go as smoothly as everybody wants it to be. For there are multiple challenges surrounding it and facing its pitfalls may be discouraging and frustrating both for teachers and students. Literature confirms that both students and teachers have struggles in online learning [3]–[7]. For instance, it limits teacher and student interaction, which affects the participation, motivation, and engagement of the students [8]. In addition, Gurung [9], enumerated several electricity, such as connectivity, technical /software knowledge, instructional preparation, understanding learning objectives, student motivation and discipline.

Overall, the biggest obstacle to remote teaching and learning is a slow or inadequate internet connection. Given that students' laziness (in completing school-related tasks) is somehow caused by various social media influences and that students are exposed to various online entertainment platforms that may divert their interests from studies as a result of the teachers and students' geographical separation, the learning process cannot be guaranteed. These amusing and perhaps addictive websites and applications have provided students with entertainment, but they have also caused teachers significant concern and difficulty in ensuring that learning is actually occurring remotely. Due to their lack of knowledge of many websites and programs, teachers are becoming increasingly hesitant to give compelling lectures in light of technological these students' growing proficiency. literature showed Though considerable research about remote teaching even before the pandemic, it is not based on the Philippine context. Thus, this issue is yet to be studied more because of its relevance and minimal sources. Furthermore, there is a scarcity on the number of available literatures on how Covid-19 influenced education [10] [11] [12], particularly on the challenges faced by educators in the Philippine higher education. Hence, further investigation on this research problem is imperative. This study will provide the country's Commission on Higher Education, decision and policymakers, educational leaders administrators of various educational institutions with relevant information that will serve as a guide to improve the implementation of blended learning in the country.

To gain success in remote teaching, specific challenges should be revealed. Revealing these challenges is important for removing, reducing, or solving the barriers in remote teaching and learning implementations that will be conducted as part of the new normal in the future. The general objective of this study is to reveal the perceptions of the educators who had to continue remote education during Covid-19 pandemic period, about the challenges they experienced and the recommended strategies to adapt to the new normal. For this purpose, this study specifically: (i) described the demographic profile of educators in terms of age, civil status, educational attainment, nature of job appointment, sex, number of years in teaching and number of trainings attended for the past two years; (ii) determined the challenges faced by the educators in remote teaching in higher education; (iii) identified the most appropriate teaching modality for remote learning; and (iv) analysed the relationship between the demographic profiles of educators and their perceived challenges of remote teaching.

RESEARCH METHOD

This section will explain research design, research participants, instrumentation, and data analysis.

Research design

This study was descriptive in nature and its aim was to determine the challenges faced by the educators in remote teaching in higher education using survey methods. This type of research used questionnaires to gather information from groups or subjects.

Research participants

The respondents for this study were a purposive sampling of higher education professionals or those who were teaching under the bachelor's degree program in a State College in the Philippines. The total number of respondents depended on the response rate. In total, 39 faculty members participated in the survey. This represented 95% of the total research population (N=41).

Table 1 presents the demographic profile of the respondents which were composed of 23 (58%) male and 16 (41%) female. Majority or 21 (53%) are single and 18 (46%) are in the age range between 20 to 30 years old. Twenty-three (58%) have master's degrees and 19 (48%) are permanent faculty members. Most of them (23 or 58%) have been teaching for more than five to 10 years and attended three to six training sessions in the past two years.

Table 1. Demographic Profile of Educators

Category	N	Category	N	Category	N
Age		Civil Status		Teaching experience	
20-30	18	Single	21	0-5 years	11
31-40	7	Married	17	6-10 years	12
41-50	4	Separated	1	11-15 years	4
51-60	8	Educational Attainment		21-25 years	4
61+	2	Bachelor's Degree	13	More than 25 years	8
Trainings Taken		Master's Degree	23	Nature of Job Appointment	
0-3	12	Doctorate Degree	3	Permanent	19
4-6	14	Sex	•	Contact of Service	17
7-9	5	Male	23	Temporary	3
More than 10	8	Female	16	-	

Instrumentation

The survey questionnaire was designed by the researchers. It was composed of a set of questions that determined the demographic profile of the respondents as well as the challenges they faced in remote teaching in higher education. The challenges were grouped into two: one refers to the perceptions on teaching challenges in which the respondents were asked to rank the items from the most to the least perceived remote teaching challenges. Whereas the other one determines the actual challenges the respondents faced in terms of curriculum adjustment, alignment of materials, deployment of learning delivery modalities, orientation of parents or guardians of learners as well as their training. Additional sets of questions were also asked to determine the respondents' perception on the teaching-learning modalities that they believed to be the best or the most appropriate modality during and even beyond the pandemic. Data gathering was done through emails and online surveys to the respondents of the study. The instruments underwent face validity where the survey questionnaires were reviewed by subject specialists. The validation process led to modification and improvement in the contents of the survey questionnaire.

Data analysis

Descriptive statistics including frequencies, percentages, and means was used to provide descriptive analysis of the survey. To assess the consistency in the responses of the respondents, the Kendall's W or Coefficient of Concordance was used. According to Salkind [13] the Kendall's W or Coefficient of Concordance for each item ranges from no agreement (0) to perfect agreement (1). The study also analysed the relationship between categorical variables in which Pearson's chi-square test was used. In addition, the strength of relationship among the variables was determined using the Spearman's Rank Order Correlation, in which correlation coefficient was interpreted according to the ranges provided by Cardino and Ortega-Dela Cruz [14] and Schober et al. [15].

RESULT AND DISCUSSION

The research findings are elaborated in two sections: (1) perceptions on remote teaching challenges and (2) challenges encountered by educators in higher education.

Perceptions on remote teaching challenges

From the challenges presented based on the literature, problems related to actual delivery of

instruction (e.g., coverage of course content, teaching-learning environment, etc.) were perceived to be the topmost remote teaching challenges among the respondents (see Table 2). This is followed by non-equitable access of

pupils and teachers to technologies or gadgets needed for teaching/learning; unreliability of internet connectivity for students and/or teachers; and too much additional non-teaching (or extracurricular/co-curricular) assignment to educators.

Table 2. Perceptions on Remote Teaching Challenges

Mean Rank	Rank	Remote Teaching Challenges
2.18	1	Problems related to actual delivery of instruction (e.g., coverage of course content, teaching-learning environment, etc.)
3.17	2	Non-equitable access of pupils and teachers to technologies or gadgets needed for teaching/learning
3.40	3	Unreliability of internet connectivity for students and/or teachers
3.90	4	Too much additional non-teaching (or extra-curricular/co-curricular) tasks assigned to teachers
4.59	5	Restrictive nature of various government health protocols on curbing COVID19
4.98	6	Challenges related to checking of assessment tasks
5.61	7	Stressful situations poised by production of modules/manuals in the delivery of instruction
5.89	8	Unavailability of /limitation on student-teacher interaction
6.22	9	Coping with difficulties/limitations poised by non-face-to-face teaching
		modalities (e.g., learning management systems, blended learning, distance
- 1 -	4.0	learning, etc.)
6.46	10	Lack of (motivational, structural, financial) support from the students'
		family/kinship

For some educators conducting remote online classes is itself a great challenge because they used to conduct face-to-face classroom teaching for many years. According to the study, (see [9], [16]–[19]), that the most important challenge faced by educators is unavailability of strong internet connectivity.

Not every educator and learner have a personal gadget to use. Many of them share their laptops, mobile devices and computers with their parents or siblings to keep up with their remote work. According to 2020 OECD report [20], [21] there are discriminations between socioeconomically advantaged and disadvantaged schools in terms of their access to technology. The OECD found that this polarity exists in between school where 59% of principals in advantaged schools have effective online learning platforms. Only 49% of principals in disadvantaged schools enjoyed the same access [20], [21]. Furthermore, access to reliable internet remains an issue across the U.S.

If this issue exists in developed countries, how much more in the case of a developing country such as the Philippines. According to a survey conducted by Social Weather Stations (SWS, 2021 cited in Valente [22]) only 39% of

Filipino households with members enrolled in remote online learning have strong internet connection. Also, due to inadequate sources of family income, students cannot afford to have a laptop or any gadget to support online classes.

Challenges encountered by educators in higher education

Different aspects of remote teaching challenges were identified. The results revealed how the respondents showed difficulty in identifying which among these aspects they find the most challenging. This was indicated by the descriptive equivalent of their perception rating as "neither agree nor disagree" in almost all the aspects (see Table 3).

In terms of curriculum adjustment, respondents found the alignment of the curriculum with national standards towards frameworks 21st century development as a challenge. Specifically, they find it hard to connect the content to higher concepts across other disciplines as well as to compensate for the losses in the practical aspects of higher education teaching and learning due to restrictive nature of various government health protocols on curbing Covid-19. They were uncertain about the alignment of learning materials especially in assessment designs that are sensitive to the abilities, interest, developmental preparedness at home of the learners. According to a study Muchemwa [23],

some universities are reluctant to embrace online assessment methods because they are unaware of the technology, averse to change, and concerned about the integrity of the exams.

Table 3. Challenges Encountered by Educators in Higher Education

Table 3. Changes Encountered by Educators in Figure Education	
Challenges	Overall Mean
Curriculum Adjustment	
1. Aligned with national standards or frameworks as stated, "holistic Filipino learners	
with 21st Century skills."	3.31
2. Able to connect the content to higher concepts across other disciplines.	3.31
3. Able to cope with the assessment of tasks given to learners.	3.28
4. Well within the learning trajectories aimed for the learners' corresponding year levels.	3.31
5. Able to compensate for the losses in the practical aspects of teaching and learning.	3.31
Alignment of Materials	
1. Provide flexibility for teachers in preparing for their lessons that integrate the needed	
key concepts and learning goals.	3.18
2. Ensure the links between learning goals and course design.	3.26
3. Perform activities that are suited to the multiple abilities of learners.	3.33
4. Consider the use of language and level of difficulties to various types of learners.	3.28
5. Have assessment designs that are sensitive to the abilities, interest, style of the learners.	3.08
Deployment of Learning Delivery Modalities	
1. Support remote learning elements.	3.38
2. To juggle between the demands of home and study for teachers and learners.	3.28
3. Cope with blended learning requirements.	3.21
4. Adjust to home schooling methodologies.	3.26
5. Be attuned with the technology-based implementation of teaching and learning.	3.36
Orientation of Parents or Guardian of Learners	
1. There is enough consultation undertaken by the school with the learners and their	
parents/guardians.	3.08
2. There is a support team to inform and/or to assist the parents/guardians to meet the	
educational needs of their children.	3.31
3. To properly and appropriately deliver the instruction, guidelines, rules and policies are	
communicated fully well.	3.18
4. Instructions, requirements, deadlines, and other requirements are conveyed via various	
platforms	3.33
5. Needed appropriate adjustments related to the "new normal mode of delivery" are	
specified and provided enough notifications.	3.31
Teachers' Training	
1. There is a series of capacity building workshops for teachers on how to implement the	
lessons in the new normal.	3.38
2. Teachers are trained on the specific content of new curricula upfront to be able to	
implement them well.	3.33
3. Teaching guides are well available for teachers.	3.31
4. Group exercises are held to enable collaboration and knowledge/experience-sharing	
among the teachers.	3.31
5. The teachers are prepared of the new means for content sharing and assessment of	
tasks.	3.41

Note: Range= Strongly Disagree (1.00—1.80); Disagree (1.81—2.60); Neither Agree nor Disagree (2.61—3.40); Agree (3.41—4.20); Strongly Agree (4.21—5.00).

Educators experienced difficulties in explaining their subject matter to their students, especially in giving activities, assignments, and assessments. Understanding the level of difficulty in terms of course content among students have become a pressing issue. According to the respondents, the incident opportunities that happen in face-to-face interaction fail in remote learning.

Assessment is the most important part of remote learning for learners as well as educators. And it causes stress to learners at times. So whenever there are assignments or projects, educators might face a lot of questions from the learners. As there is less communication between them, expectation from the learners' performances also differs. This can cause difficulties for teachers in assessments.

The educators also find it challenging to cope with blended learning requirements. Most of them struggle to cope with the demands of home while working from home. Educators start their day by opening multiple tabs for multiple purposes, switching between them. They attend virtual school, parents, and student meetings, trying to handle the amount of information and decide on the teaching strategy for every subject matter on each day. They are to grade the assignments coming from different places. They even experienced to work overtime and stayed online 10 hours per day to clean up the mess, set up, streamline the processes making remote teaching more efficient. They believed that they

were not fully trained to handle classes via the new normal modality. Although there were trainings and webinars attended, but still they needed some teaching guides that will help them apply all the learnings they get from those training related to remote teaching and learning. In addition, they find the communication with the stakeholders another challenge as they perceived that parents and/or guardians of the pupils were not that well-oriented in the new learning modalities for the pandemic. They believed there must be enough consultation between the school and the students' parents/guardians so that appropriate adjustments related to the "new normal mode of delivery" will be specified and provided to everyone.

In fact, technical issues are a common cause of interruption in the classroom environment, and they are even more bound to happen in an online-only environment [24]. Many educators struggle with technical issues that are unavoidable and cause stress in them. They become helpless if technical errors come in the middle of the live session or communicating with their students. Both teachers and students may face sudden drop-offs, random white noise interruptions, and voice breaks while using the internet for teaching and learning.

Furthermore, the study revealed a significant relationship between educators' demographics, and their perceived challenges of remote teaching (see Table 4).

Table 4. Relationship between Educators' Demographics and Perceived Remote Teaching Challenges

	Age	CS	Education	JA	Sex	Training	TE
Chi-Square	1.271E2**	54.804	61.905**	66.280**	27.289	92. 517**	1.261E2**
df	2	2	1	2	2	2	2
<i>p</i> -value	0.004	0.127	0.039	0.017	0.200	0.017	0.005

Note: CS= Civil Status; JA= Job Appointment; TE= Teaching experience; ** p-value<0.01.

However, the strength of relationship is weak in all the stated variables (see Table 5). That is, there were weak positive relationships among educators' age (rs= 0.382); civil status (rs=0.182); and there were weak negative relationships among education (rs=-0.259); nature of job appointment (rs=-0.267); training attended (rs=-0.030); as well as their sex and their perceived remote teaching challenges (rs=-0.151). This implies that educators perceive remote teaching challenges (changes, either their rating increases or decreases) depending on their

age, civil status, level of education, nature of job appointment, number of training attended and their sex. In particular, younger faculty members and those who are single perceived the given aspects or items to be not as challenging as compared to those who are older faculty have members, are married. and other commitments and responsibilities besides teaching profession. Although their years of teaching gave them an advantage, but still when it comes to the use of technology-based implementation of higher education teaching and learning, older faculty members find it hard to cope with the specific requirements. They find difficulty in managing their time with remote teaching. Remote teaching is completely new for them and requires intensive work. They need a scheduled planner to manage their time in an effective manner.

On the other hand, the younger faculty members find it manageable given the fact that

they characterise the next generation who are technology savvy [25], [26]. This is where the importance of right training especially during the period of emergency remote teaching should be considered [27]. Such training should be accompanied by collaboration and knowledge and experience-sharing among the educators in higher education [28].

Table 5. Magnitude of Relationship between Educators' Demographics

and Perceived Remote Teaching Challenges

		Age	CS	Education	Sex	TE	JA	Training
Challenges	Correlation	-0.382*	0.182	-0.259	-0.151	-0.272	-0.267	-0.030
	<i>p</i> -value	0.016	0.268	0.111	0.360	0.094	0.101	0.856
	N	39	39	39	39	39	39	39

Note: CS= Civil Status; JA= Job Appointment; TE= Teaching experience; *p-value < 0.05.

Kendall's W indicates congruence in the perceptions of the most challenging aspects of remote teaching among educators in higher education (see Table 6). Basically, the statistical findings showed a "moderate agreement" in the

educators' perceptions of the challenging aspects of remote teaching (Kendall's W (df=7, n=39) =0.43, p=0.00). The findings were all statistically significant.

Table 6. Summary of Remote Teaching Challenges

Challenges	Mean	SD	Kendall's W
a. Curriculum Adjustment	3.30	0.79	0.44
b. Alignment of Materials	3.22	0.99	0.39
c. Deployment of Learning Delivery Modalities	3.23	0.97	0.40
d. Orientation of Parents/Guardians of Learners	3.24	0.82	0.41
e. Teacher's Training	3.34	0.99	0.43

Note: Kendall's W level of agreement: 0.00 No; 0.10—Weak; 0.30—Moderate; 0.60—Strong; 1.00—Perfect.

When asked about the most appropriate modality for remote teaching and learning, the educators perceived blended learning as the best modality when it comes to monitoring of

learners' progress, delivery of course content, provision of assessment tasks, interactivity, learning continuity, as well as enforcement of health safety protocols (see Table 7).

Table 7. Most Appropriate Modality for Remote Teaching and Learning as Perceived by Educators

Teaching and Learning Aspects		BL		FFT		O/TV/RDL		MDL		HC	
		%	f	%	f	%	f	%	f	%	
Monitoring of learners' progress	26	67	6	15	3	8	4	10	0	0	
Delivery of course content	24	61	6	15	4	10	5	13	0	0	
Provision of assessment tasks	25	64	6	15	4	10	4	10	0	0	
Provision of interactivity	22	56	8	20	5	13	4	10	0	0	
Provision of learning continuity		61	6	15	4	10	5	13	0	0	
Enforcement of health safety protocols		51	6	15	8	20	5	13	0	0	
Maximizing learning outcomes	15	38	13	33	3	8	5	13	3	8	
Universal access to education	20	51	8	20	2	5	7	18	1	3	
Providing equitability/equal opportunities among	20	51	8	20	4	10	7	18	0	0	
the learners											
For asynchronous learning delivery	22	56	4	10	4	10	9	23	0	0	

Note: BL= Blended Learning; FFT= Face-to-Face Teaching; MDL= Modular Distance Learning; O/TV/RDL= Online/TV/Radio Distance Learning; HC= Home Schooling.

Blended learning integrates face-to-face learning, mobile learning, and online learning [24]. And since the issue of the unavailability of a network made people realise the limitations brought by completely online classes, higher educational institutions are to finally transform the learning spaces to create learning environments that will support blended learning. This approach exposes learners to a rich blend of learning experiences, including controlled face-to-face teaching, online learning (synchronous and asynchronous forms of educational modules in printed materials or e-copies), and active student engagement with course content.

CONCLUSION

This study's overarching goal is to shed light on the opinions of the educators who had to continue remote instruction throughout the Covid-19 pandemic period, as well as the difficulties they faced and suggested solutions for adjusting to the new normal. The results showed that among the difficulties experienced by educators were issues with the actual delivery of instruction, access to tools or technology required for instruction, internet connectivity, and the assignment of additional non-teaching activities. The survey also showed a strong correlation between the demographics of educators and how difficult they viewed remote instruction to be. The results of Kendall's W showed agreement in how higher education teachers perceived the hardest parts of remote teaching.

The study revealed the challenges experienced by educators in a higher education institution during the remote teaching and learning process implemented due to the Covid-19 pandemic. This pandemic imposed the rapid training and upskilling of educators and students to deliver and learn the lessons in ways that are unfamiliar to them. The issues and various responses have exposed shortcomings educational systems, while creating new opportunities to transform education to a new paradigm that is more resilient. This pandemic is not the first, nor will it be the last, to impact education systems worldwide. Thus, there is a need to find ways on how educators could be able to adjust with the basic requirements for successful implementation of remote teaching. All stakeholders need to be involved in developing strategies that can be implemented in the short-term as well as long-term. A dialogue between and among members of the academic community is therefore critical in making informed policy to adapt to the new normal in higher education.

Although remote teaching may not guarantee the same level of quality compared to face-to-face education; the quality of instruction depends more than ever on the will of teachers to be trained and become more accustomed to online tools. Thus, school leaders and administrators must provide educators with the time, the tools, and the training to meet these new responsibilities.

Active blended learning is an interesting option. However, it will encompass challenges among education stakeholders. It will require some minor to major curricular revisions and the identification of the types of teaching and learning activities that need to be applied in the classroom, at school and even at home. The quantity and quality of the educators must also be taken into consideration. This may indicate some significant investments in terms of qualified educators and those who are able to develop and use appropriate instructional materials. It is crucial to continuously train teachers to master new technologies to overcome the digital age challenges.

In many cases, older faculty members have struggles to manage their time with remote teaching given that they are not familiar with it. It can be exhausting for those who serve as facilitators of teaching and learning. An easy way to overcome fatigue caused by the overuse of technology is for them to take a short break. By doing some stretching, relaxing yoga, or aerobics—basically anything that involves physical activity can help regain the energy from whole-day work.

The pandemic tested the resilience of higher education institutions as they executed remote teaching and learning, adopting, and adapting to unfamiliar technologies, and meeting the instructional needs of learners. The next phase for higher education is to harness what worked well during the emergency response period and use those experiences to improve pedagogical practices for the benefit of both internal and external constituencies in the future. Although there are still significant challenges to adopting remote teaching techniques and technologies, but with the correct pedagogy and digital tools

backed up by full institutional support, it is possible to overcome the challenges of remote

teaching and adapt to the new normal in higher education.

REFERENCES

- [1] UNESCO, "1.37 billion students now home as COVID-19 school closures expand, ministers scale up multimedia approaches to ensure learning continuity," UNESCO, 30-Mar-2020.
- [2] V. Singh and A. Thurman, "How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018)," *Am. J. Distance Educ.*, vol. 33, no. 4, pp. 289–306, Oct. 2019.
- [3] A. Andersson and Å. Grönlund, "A Conceptual Framework for E-Learning in Developing Countries: A Critical Review of Research Challenges," *Electron. J. Inf. Syst. Dev. Ctries.*, vol. 38, no. 1, pp. 1–16, Jul. 2009.
- [4] P. B. Arinto, "Issues and Challenges in Open and Distance e-Learning: Perspectives from the Philippines," *Int. Rev. Res. Open Distrib. Learn.*, vol. 17, no. 2, pp. 2605–2628, Mar. 2016.
- [5] R. E. Baticulon *et al.*, "Barriers to Online Learning in the Time of COVID-19: A National Survey of Medical Students in the Philippines," *Med. Sci. Educ.*, vol. 31, no. 2, pp. 615–626, Apr. 2021.
- [6] S. Dubey, B. Piroska, and M. Gautam, "Exploration of Factors Affecting Learners' Motivation in Elearning," *Int. J. Sci. Res. Comput. Sci. Eng. Inf. Technol.*, vol. 173, pp. 1269–1275, May 2019.
- [7] J. Gillett-Swan, "The Challenges of Online Learning: Supporting and Engaging the Isolated Learner," *J. Learn. Des.*, vol. 10, no. 1, pp. 20–30, Jan. 2017.
- [8] T. Kung-Keat and J. Ng, "Confused, Bored, Excited? An Emotion Based Approach to the Design of Online Learning Systems," in 7th International Conference on University Learning and Teaching (InCULT 2014) Proceedings, vol. 173, Singapore: Springer Singapore, 2016, pp. 221–233.
- [9] S. Gurung, "Challenges faced by teachers in online teaching during Covid-19 pandemic," *online J. distance Educ. e-Learning*, vol. 9, no. 1, pp. 8–18, 2021.
- [10] W. Bao, "COVID-19 and online teaching in higher education: A case study of Peking University," *Hum. Behav. Emerg. Technol.*, vol. 2, no. 2, pp. 113–115, Apr. 2020.
- [11] E. J. Sintema, "Effect of COVID-19 on the Performance of Grade 12 Students: Implications for STEM Education," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 16, no. 7, pp. 2605–2628, Apr. 2020.
- [12] Z. Yan, "Unprecedented pandemic, unprecedented shift, and unprecedented opportunity," *Hum. Behav. Emerg. Technol.*, vol. 2, no. 2, pp. 110–112, Apr. 2020.
- [13] N. J. Salkind, Encyclopedia of research design. SAGE Publications, Inc, 2010.
- [14] J. M. Cardino and R. A. Ortega-Dela Cruz, "Understanding of learning styles and teaching strategies towards improving the teaching and learning of mathematics," *LUMAT Int. J. Math, Sci. Technol. Educ.*, vol. 8, no. 1, pp. 2605–2628, May 2020.
- [15] P. Schober, C. Boer, and L. A. Schwarte, "Correlation Coefficients: Appropriate Use and Interpretation," *Anesth. Analg.*, vol. 126, no. 5, pp. 1763–1768, May 2018.
- [16] P. R. Ujianti, "Challenges Faced by Teachers in Remote Area During Pandemic Covid-19," in *Proceedings* of the 5th International Conference on Early Childhood Education (ICECE 2020), 2021, vol. 538, pp. 343–346
- [17] R. Rasmitadila *et al.*, "The Perceptions of Primary School Teachers of Online Learning during the COVID-19 Pandemic Period: A Case Study in Indonesia," *J. Ethn. Cult. Stud.*, vol. 173, pp. 90–109, Jul. 2020.
- [18] I. Fauzi and I. H. Sastra Khusuma, "Teachers' Elementary School in Online Learning of COVID-19 Pandemic Conditions," *J. Iqra' Kaji. Ilmu Pendidik.*, vol. 5, no. 1, pp. 58–70, Jun. 2020.
- [19] T. Sari and F. Nayır, "Challenges in Distance Education During the (Covid-19) Pandemic Period," *Qual. Res. Educ.*, vol. 9, no. 3, p. 328, Oct. 2020.
- [20] OECD, Were Schools Equipped to Teach--and Were Students Ready to Learn--Remotely? PISA in Focus. No. 108. OECD Publishing, 2020.
- [21] OECD, PISA 2018 Results (Volume V): : Effective Policies, Successful Schools. Paris: OECD Publishing, 2020.
- [22] C. S. Valente, "39% of Filipino families with distance learners have 'strong' internet connection -- SWS," *The Manila Times*, 06-Mar-2021.
- [23] S. Muchemwa, "Integrity of university online assessment: Towards developing a function model," *Eureka J. Educ. Res.*, vol. 1, no. 2, pp. 67–73, Feb. 2023.
- [24] R. A. O. Torres and R. A. O.-D. Cruz, "Remote Learning: Challenges and Opportunities for Educators and Students in the New Normal," *Anatol. J. Educ.*, vol. 7, no. 1, pp. 83–92, Apr. 2022.
- [25] J. D. Chaudhuri, "Teaching the Generation Y Anatomy Student," EC Clin. Exp. Anat., vol. 1, pp. 62–70, 2018.

- [26] R. O.-D. Cruz, "Pedagogical practice preferences among generational groups of learners: Towards effective twenty-first century higher education," *J. Univ. Teach. Learn. Pract.*, vol. 17, no. 5, pp. 84–103, Dec. 2020.
- [27] T. Trust and J. Whalen, "Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic," *J. Technol. Teach. Educ.*, vol. 28, no. 2, pp. 189–199, 2020.
- [28] J. Salmi, COVID's Lessons for Global Higher Education: Coping with the Present while Building a More Equitable Future. Indianapolis, IN: Lumina Foundation, 2020.