Asia Pacific Journal of Advanced Education and Technology
Volume 1, Issue 2, June 2022 / P- ISSN 2815 – 245X / E – ISSN 2815 – 2468 / www.apjaet.com

STEM Students' Experiences in Modular Distance Learning Amidst Pandemic: Basis for Academic Interventions

Rea Christymae A. Duran[1], Edna Q. Sumagang[2]
https://orcid.org/0000-0002-6315-9938
reachristymae@gmail.com[1], ednaquilabsumag@gmail.com[2]
J.H. Cerilles State College, Pagadian City, Zamboanga del Sur, Philippines

Abstract

The face-to-face learning engagement of students and teachers within the school has been suspended due to the Covid-19 pandemic. Hence, the Department of Education's mantra of "no child left behind," paved the way for Modular Distance Learning (MDL) implementation as an immediate response to ensure educational continuity. This qualitative case study approach was conducted in Zamboanga del Sur National High School – Senior High School. The study employed multiple case studies on STEM students' experiences in MDL amidst the pandemic. Findings revealed that the challenges encountered by STEM students on MDL are more prevalent on adjusting to a new setup, poor internet connection, and power interruption, lack of motivation, lack of presence of teachers, and learning loss, doing their households while trying to finish their modules. Students felt foreign since everything is new and described it as hard, overwhelming, and unideal. They had a hard time adjusting, notably for the first few weeks since self-learning is new to them but making self-learning their guide throughout everything is much more difficult. Nevertheless, students emphasized that a sense of independence in learning, as it is a non-interactive manner, was cultivated. These claims were also confirmed by a teacher who handles STEM students and a parent whose learner is enrolled in the said strand. Both agreed that the learners are faced with vast challenges during this learning period. With all the challenges mentioned, students' central coping mechanism to battle against is to master the art of time management. Along with this is watching YouTube or playing mobile games during their self-imposed vacant time and staying positive. Accordingly, an intervention program can be initiated to mitigate the situation. The Give E-CARE (Giving Electronic - Careful Attention and Relief Everywhere) program may benefit the students, the teachers, the parents, and of course, the school on this pandemic education.

Keywords: STEM Education, STEM students' experiences in modular distance learning, case study, Philippines

Introduction

Covid-19 was declared by the World Health Organization (WHO) as a global pandemic in March 2020 and warned of its highly contagious nature (WHO, 2020), In an attempt to secure students' and teachers' health during the COVID-19 pandemic, many schools have transferred a significant, if not all, portion of their classrooms to remote teaching.

Notwithstanding, the challenges of new teaching modalities are not unique. Culture, technology, infrastructure, and skills are challenges faced by learning professionals in general (Moorhouse, 2020). More research is required to explore the obstacles that prevent students from achieving their learning objectives. Basilaia and Kvavavadze (2020) have proposed that the quality of learning should be explored in future research studies. During the COVID-19 pandemic, students' self-regulatory learning became the critical learning method, but it remains to be evaluated if this learning method is successful (Cai, Wang, Xu, and Zhou, 2020).

According to a report published last 2019 by the Federal Communications Commission, 21.3 million people do not have high-speed internet connections. Low-income students often rely on traditional, less stable laptops and smartphones for their classroom work. Lack of access to easy, affordable, and secure internet connections hinders the

online learning process, particularly for those living in rural and marginalized communities (Wains & Mahmood, 2008 as cited in Adnan & Anwar, 2020).

Findings of the study conducted by Tee, et.al (2020) on the Psychological impact of covid-19 in the Philippines showed that students reported higher psychological impacts as well as more signs of depression, anxiety and stress compared to those working individuals (Cao, et al., 2020 as cited in Tee, et al., 2020).

In the Philippines, the abrupt shift to online learning sparked a heated debate, citing the learners' poor living conditions. According to Magsambol (2020), there is a clear divide between those who can and cannot afford the resources to access the new education platform. The DepEd's mantra of 'no child left behind,' the general condition of children in the public school system, sends inequality. Learning, on the other hand, cannot be canceled to drive the economy. This resulted in tighter measures for educational institutions to maintain operations despite the impending risk (Ancheta, 2020).

The Department of Education (DepEd) responded by issuing Department Order Nos. 007, 12, 13, and 14 series of 2020, directing all basic education institutions to develop learning continuity plans (LCPs) for the school year 2020-2021. (Ancheta, 2020). LCP is a set of education interventions developed in response to the Covid-19 pandemic's educational challenges. This strategic plan will ensure that students, teachers, and school personnel are safe and healthy during a pandemic by following Department of Health and World Health Organization protocols (DepEd Order Nos. 12 and 13, 2020).

Eliminating these disparities is critical to maintaining STEM diversity. The STEM strand emphasizes science and math, and students must be proficient in calculating, memorizing terms and formulas, and analyzing and solving problems. STEM integrates the four disciplines into a coherent learning paradigm based on real-world applications (Hom, 2014). Issues like equity, student safety, learning quality, and evaluation performance (Winthrop, 2020 as cited in Tria, 2020).

None in the Philippines has yet conducted this study. No similar study has been done locally to identify the challenges and experiences faced by STEM students when using modular distance learning during a pandemic, so it is vital that the school administration is informed to better prepare for the challenges of COVID-19 on education systems when using modular distance learning. This study may address these issues by developing a supportive and engaging intervention program for underrepresented STEM students.

Objectives of the Study

This study aimed to identify the experiences of STEM students on modular distance learning amidst the pandemic. Moreover, it sought to fulfill the following specific objectives: 1) to describe the STEM students learning experiences before the pandemic; 2) to evaluate STEM students' learning experiences after the shift to modular distance learning; 3) to determine different challenges encountered by STEM students towards the modular distance learning and how do they overcome it; and 4) to design an intervention program (activities address the identified challenges brought by the modular distance learning modality amidst the pandemic.

Methodology

The research made use of a qualitative case study approach, particularly patterned from Robert E. Stake's *the Art of Case Study Research* because it has a flexible design that allows researchers to make significant changes even after moving from design to research. It used multiple case studies. The researchers studied several programs from different research sites or within a single site. By replicating the procedures for each case, Yin (2009) suggests that the multiple case study design uses replication logic. In addition, the study used purposive sampling as a sampling technique in choosing the participants in the study to provide a piece of in-depth and detailed information about the study under investigation to find out their experiences and challenges in modular distance learning.

30 Pagadian City Division Grade 12 Senior High School students enrolled in the STEM Strand for the 2020-2021 school year were studied. The students were identified based on their GWA (GWA). To verify the data collected, a parent and Science teacher were interviewed using the same set of questions as students but slightly modified to fit their perspectives (Stake, 1995).

As part of the new normal, data were collected online. The students who were chosen for the online interview via Google Meet were given a consent form to confirm their participation. The obtained data were analyzed and interpreted. Addison (1999)'s editorial analysis style and Stake's phases of data analysis (description, categorical aggregation, pattern establishment, and naturalistic generalizations) (1995, 2005). Using this description, the researcher began by interviewing participants via online FGD, recording impressions, and observing artifacts and documents, if any.

Results and Discussions

Based on the data gathered from the focus group discussion, the students from Case 1, Case 2, and Case 3 articulated their learning experiences before and amidst the pandemic. From the responses, the researcher was able to formulate academic interventions

1. Students' Learning Experiences Before the Pandemic

Case 1 student participants believed their learning experiences before the pandemic were more interactive and effective because they could share ideas and views with their classmates and ask questions of their teachers when they didn't understand a topic. Teaching strategies like reporting, role-playing, oral recitations, moving exams, and board work that isn't just limited to reading modules and answering activities were included.

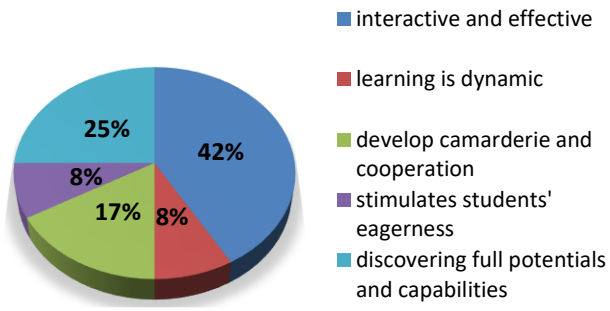

Figure 1. Pie Chart of Case 1 student participant's responses

The current study found that students' descriptions of their learning before the pandemic were enjoyable. There was teacher-student, student-student, and even teacher-parent interaction. With a teacher present, students can immediately ask questions, express their viewpoints, and share their ideas.

The respondents in Case 2 support the claims in Case 1. That the teacher could immediately give feedback to students and assess whether they had learned the lesson. In short, there is a real-time situation with real-time conclusions for both the teacher and the students. They both agreed that learning has a significant and continuous impact on them.

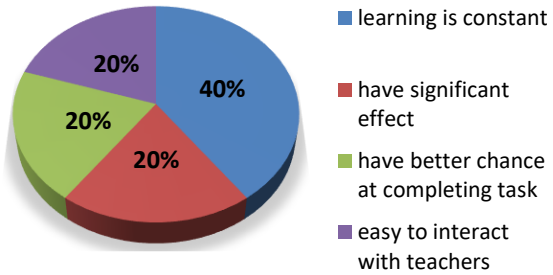

Figure 2. Pie Chart of Case 2 student participants responses

Certainly, these students' learning experiences have undoubtedly influenced their way of thinking, task completion, and ability to communicate and interact with classmates, friends, and teachers. The constant contact between students and teachers helps students overcome their fears, according to research. Questions, opinions, and disagreements are important because they allow students to develop a "sense of community," reciprocal interdependence, trust, and shared goals and values (Davies & Graff, 2003; Rovai, 2002).

Likewise, the *Case 3* respondents emphasized the word “enjoyable.” Just like the answers coming from case 1 and case 2, they all agreed that learning was more fun before the pandemic since there were interactions with friends, classmates, and teachers.

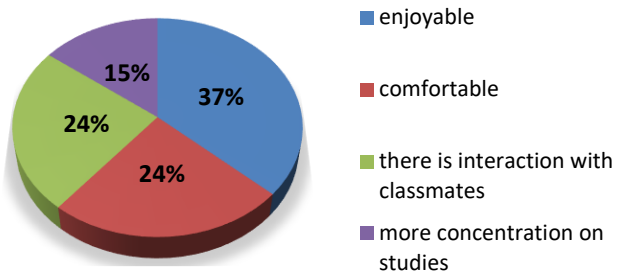

Figure 3. Pie Chart of Case 3 student participants responses

Several studies stated that enjoyment is the state or process of enjoying something. As a result, a humorous lecture is assumed to be more engaging and satisfying for students. One of the most common misconceptions is that learning should be fun (Torok et al., 2004; Jalalkamali et al., 2016 as cited in Hernik & Jaworska, 2018). Powell and Andresen (1985) claim that using humor in education helps students understand, concentrate, defuse anger, develop a positive attitude toward the mission and instructor, and reduce anxiety (Baid & Lambert, 2010).

A Science teacher confirmed the students' experiences, saying they had a lot of fun learning before. Students were encouraged to share their ideas and receive immediate feedback from their teachers or peers on their performances. According to Barindra De (2018), classes allow them to interact with peers their age, focus, keep a schedule, and improve their physical and mental health. Learning effectiveness was multidimensional and should be tested (Ni, 2013).Similarly, a parent of one of the students in Grade 12 STEM was also asked to share her views. The parent has disclosed that the learning experiences of her daughter as a STEM student before the pandemic was very dynamic and full of interesting activities.

To put it another way, Erik Erikson's Psychosocial Theory of Human Development states that every human being undergoes changes in both interpersonal and social interactions (Erikson, 1963). In addition to emotional support and a safe environment for self-disclosure, children's friendships also provide companionship. These provisions protect children at school (S.R. Asher & K.L. McDonald, 2010).

Based on the results gathered from the students, the teacher, and the parent, the most common experience they shared before the pandemic happened were the presence of interaction and sharing of ideas. One of the top-performing STEM students expressed that:

> *“The best description that I could give to my learning experiences as a STEM student before the pandemic is that it is dynamic. Dynamic in a sense that the way of teaching is not limited to just reading modules and answering activities. You have to do reporting, performance tasks like roleplays, oral recitations, which I think is very helpful for students to really understand the lesson”. [TP-4-5-B-SHS]*

This finding supports Arslan's (2018) claim that adolescents value social acceptance and social connectedness. From Abraham Maslow's perspective, teachers and parents had already surpassed the level of social needs. Given their age and life experiences, they may have already achieved self-actualization. However, students were in crucial years of connecting with others to meet their social needs.

2. Students' Learning Experiences After the Shift to Modular Distance Learning

As the students in Case 1 revealed, the respondents find it difficult. They have developed a sense of independence in learning because it is non-interactive. They agreed that it was difficult, overwhelming, and unsatisfactory because everything was new. They had a difficult time adjusting at first because self-learning is new to them but using self-learning as a guide throughout is much more difficult. Lessons that require more interaction with others were boring because they had no one to practice with – the family is busy; family members work. They are used to face-to-face interaction, so modular distance learning is not their style. Some modules were also deemed confusing by respondents.

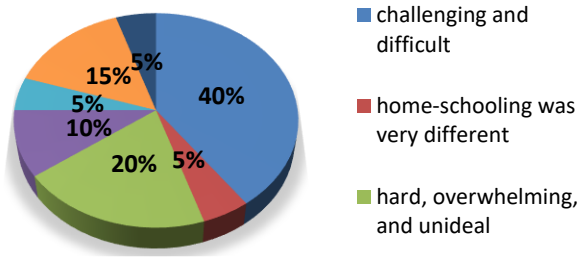

Figure 4. Pie Chart of Case 1 student participants' responses

According to a conducted survey by the Department of Education (DepEd), printed and digital modules are used for learning and were identified as the most popular method and preferred distance learning form by parents with children enrolled in this academic year (Bernardo, J). This also applies to students in rural areas without internet access (Pe Dangle & Sumaoang, 2020).

Case 2 students also discussed their transition to modular distance learning. Respondents revealed that learning is difficult at this time, especially for STEM students, who must learn on their own and are distracted by many factors. To make matters worse, some teachers required timely submission of modules via an educational platform. Modules, according to respondents, promote self-directed learning.

Naimie, Z. and Siraj, S. (2010) stated that "when students can use their preferred learning styles, they will learn more and have a better time in class and in the environment." (Naimie & Siraj, 2010). The results of this report, which involved 310 students and four teachers, show that students learn more when teachers adapt their lessons according to the learning styles found in their classrooms.

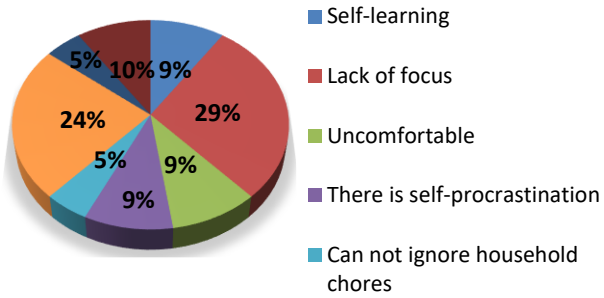

Figure 5. Pie Chart of Case 2 student participants responses

Moreover, *Case 3* student-participants relate to the experiences of the case 1 and case 2 respondents. Most of them revealed the same experiences in learning, such as challenging, and difficulty learning the lessons on their own. However, this category of students has unveiled the experience of answering their modules while admitting that they are not independent learners. Thus, for STEM students, modular distance learning gives them several kinds of negativities for learning.

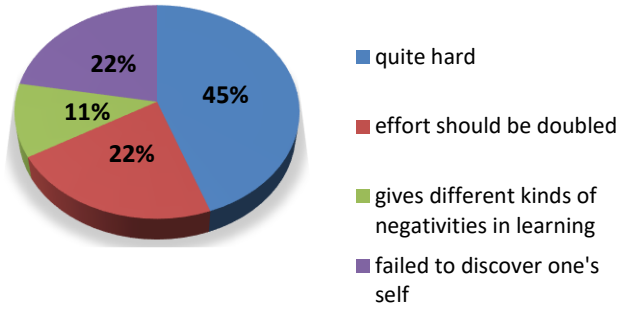

Figure 6. Pie Chart of Case 3 student participants' responses

As eloquently stated by Pe Dangle and Sumaoang (2020), modular distance learning has benefits and drawbacks. Modular instruction gives students more options and allows them to work at their own pace. Teachers and staff will have more options. Lesson materials are now more adaptable. Students' self-discipline and motivation improve, but teachers' and staff's motivation suffer due to increased preparation time and lack of tangible rewards. In their study, 90% of participants struggled to answer their modules. Half of them can't finish all modules in a week.

Similarly, the teacher was interviewed in this study and stated that students' learning is undeniable even without direct instruction. She even mentioned that students must study independently using their self-learning module. Students have no choice and they can still consult their teacher online, but it is a very different experience for both parties. She also noticed that not all students submit modules on time. She was surprised to learn their reasons for tardiness. Because this pandemic affects their families, some of them work part-time. Some of the STEM students are prepared for the future, while others are not.

Likewise, as a parent, it has given the pros and cons of pandemic education. One of the benefits mentioned by the parent is monitoring her daughter's study habits. As a result, she doubles her time and effort, but the disadvantage is that the learner developed a habit of sleeping late at night to finish the module. She noticed that the learner struggles with her modules and is always rushing to finish them. This was never observed in classroom learning. In her final statement, she stated that this pandemic changes everything, not just for our students, but for everyone. Because everything is now online, internet connectivity is a must.

Based on the responses from the students, the teacher, the parent, they all consented that their experiences when shifting to MDL was stressful, uncomfortable, challenging and difficult. This is where the evaluation of learning of the students comes in where the teacher said that there is uncertainty in their learning and even students expressed their opinion on the shift to modular distance learning as:

> *"Much more challenging and a bit difficult to adapt in".*
> *[TP-5-4-G-PS]*

> *"It is kind of hard because I understand and learn the lessons by myself without the guidance of the teachers that is why I described it hard*". [LP-2-110-B-SHS]

Difficult in a sense that everyone needs to adjust with the new normal setting where self-learning is encouraged as shared by one of the students:

> *"My experience in modular distance learning was hard because it is all about self-learning". [AP-1-53-G-SHS]*

Online and smartphone apps are unlikely to be very effective in maintaining learning consistency unless they are accompanied by teacher-guided modalities. During school closures, teachers should guide students and support parents/caregivers (UNICEF, 2020). Their research focused on student self-regulation. A comparison of students who

used mechanized learning methods and those who could use their existing knowledge to understand and explain new knowledge found no significant differences in knowledge gained. The study of subjects that required understanding, synthesis, and development differed significantly (as cited in Cai et al., 2020).

3. Challenges Encountered by STEM Students in Modular Distance Learning

This study also looked into challenges/problems. Case 1 respondents listed their STEM student challenges/problems in modular distance learning. The most common challenges students face is adjusting to a new learning environment, poor internet connection, lack of motivation, and time management. Countless activities in one module drained their energy. They may have spent a lot of time on physics, chemistry, biology, and math. This may be why some students missed the submission deadline.

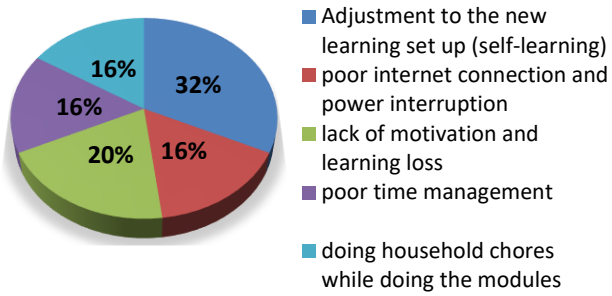

Figure 7. Pie Chart of Case 1 student participant's responses

Another challenge confronted by the students is they have developed anxiety due to lack of sleep and overfatigue. The reason for this is their experience of doing household chores while answering their modules.

Also, Case 2 respondents reported frequent personal issues such as money issues. Online information access is difficult for students from low-income families, where every cent counts. Having internet access helps alleviate their boredom by answering modules, but they can only afford a data subscription. It's difficult for them to comprehend when no one explains to them why STEM is a difficult academic path. Case 2 student participants also mentioned a lack of family support/assistance.

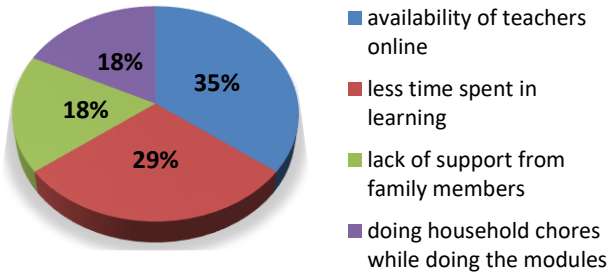

Figure 8. Pie Chart of Case 2 student participants' responses

Rich (2020) advises parents to cast their children's fears. Their role grows as their kids homeschool. They should be aware of their children's negative reactions as this causes stress. When doing independent learning, reasonable distractions are advised. Before confronting their children, Saxena & Saxena (2020) advise parents to control their anxiety and maintain mental health. In the absence of teachers, parents' support is critical to children's learning development (Ancheta, 2020). That family emotional support plays an important role in fostering positive academic

outcomes is found in Roksa and Kinsley's 2019 study The Role of Family Support in Facilitating Academic Success of Low-Income Students.

Moreover, Case 3 respondents stated that their experiences are similar to the others. Only, they revealed the most pervasive laziness in answering their modules. One factor identified is ambiguous instructions and concept explanations in some modules.

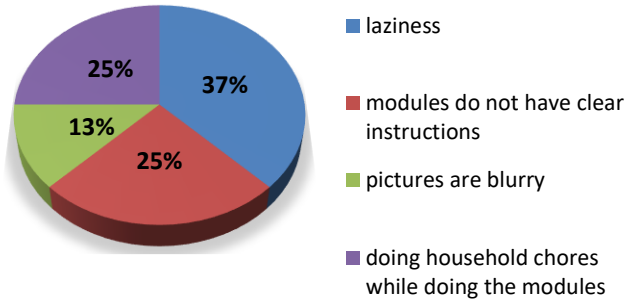

Figure 9. Pie Chart of Case 3 student participants' responses

According to the teacher interviewed, students are truly exhausted from being bombarded with self-learning modules to finish in a week or two. Students without a conducive area to study or answer their modules are being forced to do household chores by their parents or siblings, and the most prevalent is the use of data only instead of internet connectivity, which they cannot afford.

Many of the challenges mentioned by the parent are also mentioned by the students. As a working parent, the parent confirmed that finishing 7-9 self-learning modules in a week is exhausting and difficult for her daughter. This is why her student slept late at night and lost weight.

Consequently, teachers, students, and parents all agreed that the quality of teaching and learning declined during the lockdown and the adversities that everyone felt. However, poor internet connectivity is not a problem for the teacher; it only becomes a hindrance when meeting with students and parents online. This was confirmed when one of the top-performing students shared their internet connection experience:

> *"…our house is miles away from our school so instead of having printed modules I opted for e-modules and this kind of setting is actually hard for me because in our place, the signal and internet connectivity aren't that great, so whenever I need to pass my outputs through online, I still need to find a place with better signal". [TP-1-1-G-SHS]*

Likewise, same scenario is experienced by average-performing and low-performing students:

> *"Sometimes, the internet connection is slow and I find it hard to search for something I'm confused about. Also, sometimes there will be power interruption". [AP-1-43-G-PS]*

> *"One of the challenges I have encountered during modular distance learning is poor internet connection…" [LP-2-90-G-PS]*

Internet access is a major issue (Garrotte Jurado, et.al., 2010). Slow internet connections in the classroom and at home are a concern for both teachers and students. For example, they do their homework instead of meeting in class when they have a more stable connection (Husniyah, 2019).

4. Students' Coping Mechanisms on the Implementation of Modular Distance Learning

The student participants in Case 1, Case 2, and Case 3 reveal their challenges. Time management is a key coping mechanism for STEM students. Also, students should be able to self-manage their learning. Distance learning can be difficult, isolating, and discouraging for even high-achieving students, according to Saykl (2018). Distance learners also need self-management skills, according to previous research (Artino & Stephens, 2009).

The students' responses show that they are staying positive despite the situation. It also helps them when they ask for help from friends, develop self-efficacy, and reward themselves after completing a task.

A supportive environment fosters a sense of belonging, according to Zer and Saçkes (2011). This finding shows that learning is a complex process that includes personal interactions and perceptions (Walker & Greene, 2009).

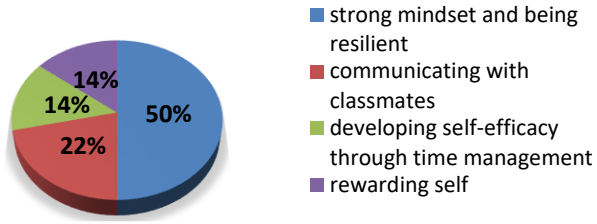

Figure 10. Pie Chart of Case 1 student participant's responses

Students said having a positive attitude and being resilient helps. Carol Dweck (2011), a psychology professor at Stanford University, and her colleagues studied resilience in students from varied backgrounds. Students may view intellect as a fixed quantity that may be increased via effort and instruction (fixed mindset) (a growth mindset).

Case 2 respondents also described how they overcame challenges in modular distance learning. In addition to ignoring temptations, setting up a schedule to manage time, asking teachers for permission to delay module submissions, and trusting in our Almighty God.

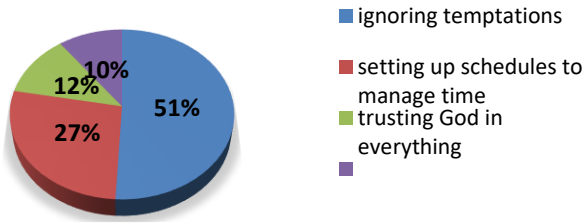

Figure 11. Pie Chart of Case 2 student participants responses

How these students manage their hectic lifestyles is essential to their academic progress and sense of accomplishment (Gallagher, 2003). Pupils' lack of organizational abilities determines which students get the most out of their educational experience (Gallagher, 2003).

In conclusion, *Case 3* respondents emphasized that staying positive amidst everything is the best thing to do in this time of crisis. Yet again, like the other two (2) cases, they came across with managing time efficiently.

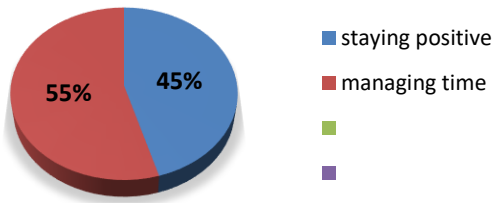

Figure 12. Pie Chart of Case 3 student participants' responses

Eva and her colleagues (2021) defined optimism as a psychological phenomenon that influences many aspects of life, and optimistic people always look forward to the future. The study's findings and discussion revealed that optimism reduces anxiety and fear, but it must be accompanied by positive behavior. It is a skill to manage time, and every learner must be familiar with and command this skill for better results. A student can only survive if he/she has the ability of time utilization properly. Many students do not possess such skill; they do not know how to manage their time or handle time.

The teacher revealed that most students really asked for help answering their modules, which is fine with her. "Everyone needs a little help and kindness in this difficult time", she said. Work-family conflict and decreased well-being are avoided by receiving support from family and supervisors, according to Bossche and his colleagues (2013).

From the parent's eyeview, time management is one of the solutions which her daughter overcame naturally due to changes in the scheduled distribution, providing internet connectivity as this has become a need due to the implementation of distance learning, and asking for help to send out the modules.

Students, teachers, and parents all agreed on one primary solution to coping, which is managing time efficiently. In the absence of a teacher, some students felt that distance learning required more self-discipline and problems were more difficult to solve as expressed to wit:

> *"I overcome these challenges by having a strong mindset and great time management." [TP-1-1-G-SHS]*
>
> *"I conquer the obstacles in modular distance learning by staying organize or making a daily journal, managing my time…"[AP-5-57-G-SHS]*
>
> *"Well, I overcame the challenges by doing time management, just putting a lot of time into answering my modules and lessening the time on playing mobile games…" [LP-2-110-B-SHS]*

Parents should teach their children time management early on (Lisa & Robert, 2008). (Ahmad et al., 2019). One study found that a group of students has moderate time management skills and only a few have mastery of time management. They are excellent time managers and therefore good performers (Yilmaz, Yoncalik, & Bektas, 2006).

5. Proposed Intervention Program: Give E-CARE

Due to the COVID-19 pandemic, face-to-face learning engagement of students and teachers within the school has been suspended. This pandemic has paved the way for Modular Distance Learning (MDL) implementation as an immediate response to ensure educational continuity. As an output of this study, the researchers recommended various academic interventions that may address the identified student challenges, which may also benefit the teachers and the parents. Give E-CARE (Giving Electronic - Careful Attention and Relief Everywhere).

This academic intervention initiates series of activities through the efforts of the guidance counselors and the teachers. This is primarily designed to address the identified student challenges; the following programs are named: *adopting the self-help behavior modification modules, a special focused group for virtual (socmed) interaction, establishing a one-stop portal with key resources and guidance, and strengthening consultation hours.*

Adopting the Self-help Behavior Modification Modules. As highlighted by Reyes et al (2019), over-involvement in activities other than education and personal development become a significant worry for schools. This is especially true now that everyone's health and safety are at risk owing to the epidemic. It not only disrupts student time management but also produces personal issues that affect students' ability to focus. Schools must allow kids who want to change their conduct to actively engage. Students would participate in self-help procedures to force cognitive diversion. An example of active self-help involvement is mindfulness. Modules on virtuality acceptance will also be addressed so that students can learn to incorporate virtuality into their daily routines and become more sensitive to the phenomenon. Future social interactions will involve virtuality based on numerous game-like aspects, according to Bekir and Selikit's research (quoted in Reyes, 2013). They wanted to know about teachers', parents', and students' experiences using Modular Distance Learning. 90% of participants had trouble answering their modules, indicating that most learners are struggling with this new learning method.

Aspects of external and internal impacts on behavior are identified by Bandura (1986). When teenagers are exposed to external pressures such as media and peer messages that promote risk-taking, they seek not just to comply to others' preferences (external standards), but also to self-evaluation and internal standards (Greene, 2013).

Special Focused Group for Virtual (Socmed) Interaction. Students, as revealed in this study, struggle to communicate with professors and friends. To address this, kids should build positive self-concepts by providing a supportive atmosphere for students with unique concerns. Low self-esteem is a root cause of the inability to communicate and connect with peers and teachers. The COVID-19 dilemma may influence students' learning, according to Di Pietro et al. It looks into the virus's direct and indirect effects on children's achievement. Teachers should learn how to adjust their position to a circumstance where they can only communicate online and where even pupils who normally perform well in school may lose enthusiasm when learning online. Teachers of all ages must be taught in the finest pedagogical practices for online and blended learning. This is especially true for underprivileged girls and boys, as instructors can provide essential support in times of need, as well as promote and assure children's return to school once schools reopen.

Establishing a One-Stop Portal with Key Resources and Guidance. A single, regularly updated national or regional (government) portal or website that provides complete one-stop guidance and information on the COVID-19 education response. Courses options (such as online digital literacy training) and connections to vital web resources may be included (UNICEF, 2020).

Rather than an overwhelming collection of materials, give a selected selection of resources in relevant languages that are linked with the curriculum and grade-level educational objectives. It should contain instructional websites and materials accessible via low-cost mobile phones, and any new resources should consider these phones' constraints.

People must be informed about new learning programs and how to access them (e.g., which TV channels, which grades, and when), for example, through teacher phone calls, newspapers, TV and radio broadcasts, social media campaigns, the above-mentioned ‘one-stop website,' or even through monitoring surveys.

Strengthening of Consultation Hours. Respondents in this survey expressed concern about coping with pandemic education course subjects. Thus, individualized time for kids to address specific academic issues. According to Reyes et al (2019), personal interaction between teachers and students can reduce the teacher factor. Creating policies and procedures may also help students grow personally and academically. In one study, teachers were blamed for students' lack of appreciation for their academic struggles.

Academic challenges can be addressed with coaching. The expected long-run consequences of the Pathways to Education initiative, which provided disadvantaged kids with coaching, tutoring, and financial incentives (2019). It improved postsecondary education institution persistence, wages, and employment. The initiative raised adult yearly wages by 19%, increased employment by 14%, and reduced social assistance (welfare) revenues by 33% as cited in Reyes et al., (2019).

Conclusions

The current study, however, has certain drawbacks. Modular Distance Learning (MDL) is part of the Department of Education's continuity plan to keep learning going even during pandemics. For example, poor internet connection, lack of motivation, hazy photographs, confusing module instructions, poor time management, lack of teachers' help and even lack of family support were all mentioned in the multiple case study. The large number of exercises in one module further increased to students' concerns about finishing on time.

Recommendations

In this case, teachers should reevaluate their modules to make sure they meet the students' needs. Each exercise's instructions must be easily understood by students. Lessons should be simplified with additional examples. All printed graphics in the modules should be readable. Despite MDL experiences, STEM students strive for activities

that make them feel better. Observed coping techniques include viewing YouTube or playing mobile games during self-imposed downtime and keeping upbeat. Thus, an intervention program can be implemented; the Give E-CARE initiative may help students, teachers, parents, and school.

References

Aboagye, E., Yawson, J. A., & Appiah, K. N. (2020). COVID-19 and e-learning: The challenges of students in tertiary institutions. *Social Education Research, 2*(1), 109–115. http://ojs.wiserpub.com/index.php/SER/article/view/422

Addison, R. (1999). A grounded hermeneutic editing approach. In B. F. Crabtree & W. L. Miller (Eds.), Doing qualitative research (2nd ed., pp. 145-161). Thousand Oaks, CA: Sage.

Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments, 0*(0), 1–13. https://doi.org/10.1080/10494820.2020.1813180

Adnan, M., & Anwar, K. (2020). Online Learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology, Ed606496. 2*(1), 2–8.

Ahmad, S., Batool, A., & Choudhry, A. H. (2019). Path relationship of time management and academic achievement of students in distance learning institutions. *Pakistan Journal of Distance and Online Learning, 5*(2), 191–208.

Ancheta, R., Ancheta, H., (2020). The new normal in education: A challenge to the private basic education institutions in the Philippines. https://www.neliti.com/publications/345960/the-new-normal-in-education-a-challenge-to-the-private-basic-education-instituti

Anderman, E. M., & Sinatra, G. M. (2012). The challenges of teaching and learning about science in the twenty-first century: exploring the abilities and constraints of adolescent learners. https://www.researchgate.net/publication/254366394_The_challenges_of_teaching_and_learning_about_science_in_the_twenty-first_century_exploring_the_abilities_and_constraints_of_adolescent_learners

Arslan, G. (2018). Psychological maltreatment, social acceptance, social connectedness, and subjective well-being in adolescents. *Journal of Happiness Studies, 19: 983-1001,* https://doi.org/10.1007/s10902-017-9856-z

Baid and Lambert (2010). Enjoyable learning: The role of humour, games, and fun activities in nursing and midwifery education. Nurse Education Today, *30 (2010*) 548–552.

Baloran, E. T., & Hernan, J. T. (2020). *Crisis Self-efficacy and work commitment of education workers among public schools during covid-19 pandemic*. https://doi.org/10.20944/preprints202007.0599.v1

Barindra De (2018). Traditional learning vs. Online learning. *eLearning Industry,* https://elearningindustry.com/traditional-learning-vs-online-learning

Basilaia, G., & Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (Covid-19) pandemic in Georgia. Pedagogical Research, 5(4), 1-9.

Bhamani, S., Makhdoom, A. Z., Bharuchi, V., Ali, N., Kaleem, S., & Ahmed, D. (2020). Home learning in times of covid: experiences of parents. *Journal of Education and Educational Development, 7*(1), 9. https://doi.org/10.22555/joeed.v7i1.3260

Bilge, F., Tuzgöl Dost, M., & Çetin, B. (2014). Factors affecting burnout and school engagement among high school students: Study habits, self-efficacy beliefs, and academic success. *Kuram ve Uygulamada Egitim Bilimleri*, *14*(5), 1721–1727. https://doi.org/10.12738/estp.2014.5.1727

Brammer, S., & Clark, T. (2020). COVID-19 and management education: reflections on challenges, opportunities, and potential futures. *British Journal of Management*, *31*(3), 453–456. https://doi.org/10.1111/1467-8551.12425

Bruner, J. S. (1961). The act of discovery. Harvard educational review.

Bruner, J. S. (2009). The process of education. Harvard University Press

Cahapay, M. B. (2020). Rethinking education in the new normal post-covid-19 era: A curriculum studies perspective. *Aquademia*, *4*(2), ep20018. https://doi.org/10.29333/aquademia/8315

Cai, R., Wang, Q., Xu, J., & Zhou, L. (2020). Effectiveness of students' self-regulated learning during the covid-19 pandemic. *Science Insights*, *34*(1), 175–182. https://doi.org/10.15354/si.20.ar011

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects*, *49*(1–2), 91–96. https://doi.org/10.1007/s11125-020-09464-3

Davies, J., & Graff, M. (2005). Performance in e-learning: Online participation and student grades. British Journal of Educational Technology, 36(4), 6

Di Pietro, G., Biagi, F., Costa, P., Karpiński, Z., & Mazza, J. (2020). The likely impact of covid-19 on education: Reflections based on the existing literature and recent international datasets. In *Publications Office of the European Union, Luxembourg: Vol. EUR 30275* (Issue JRC121071). https://doi.org/10.2760/126686

DO 12, s. 2020 on the BE-LCP, DepEd, 2020

Dweck, C., Walton, G. M., & Cohen, G. L. (2011). Academic tenacity: Mindset and skills that promote long-term learning. *Gates Foundation. Seattle, WA: Bill & Melinda Gates Foundation*, 1–43. http://web.stanford.edu/~gwalton/home/welcome_files/dweckwaltoncohen_2014.pdf

Eva, N. et al. (2021). The Role of optimism in responding to covid-19. *KnE social sciences. KnE Publishing Platform*. https://knepublishing.com/index.php/KnE-Social/article/view/8224/14090. Doi: 10.18502/kss.v4i15.8224

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(23), 8410–8415. https://doi.org/10.1073/pnas.1319030111

Gallagher, R. (2003). Organizational skills for school success. The Parent Letter,1(3). http://www.aboutourkids.org.

Garrote Jurado, R., Petersson, T., Christie, M., Seoane, F., & Sigrén, P. (2010). Training teachers in e-learning without internet access. https://www.diva-portal.org/smash/get/diva2:887075/FULLTEXT01.pdf

Gerschler, J. (2012). Classroom strategies for maintaining student focus. *Universidad Del Papaloapan*, *September 2012*, 98.

Götz, M., Mendel, C., Lemish, D., Jennings, N., Hains, R., Abdul, F., Alper, M., Asgari, H., Babayaro, H., Blaya, C., Borzekowski, D., Cadavid, S., Camerini, L., Carmona, B., Carter, C., Chale, M., Düssel, M., Duhalde, A., Gayed, A., … Taher, F. (2020). Children, covid-19 and the media: a study on the challenges children are facing in the 2020 coronavirus crisis. https://portal.findresearcher.sdu.dk/en/publications/children-covid-19-and-the-media-a-study-on-the-challenges-childre

Hebebci, M. T., Bertiz, Y., & Alan, S. (2020). Investigation of views of students and teachers on distance education practices during the coronavirus (COVID-19) pandemic. *International Journal of Technology in Education and Science*, *4*(4), 267–282. https://doi.org/10.46328/ijtes.v4i4.113

Hernik, J., & Jaworska, E. (2018). The effect of enjoyment on learning. *INTED2018 Proceedings*, *1*(May), 508–514. https://doi.org/10.21125/inted.2018.1087

Husniyah, A. I. (2019). Blended learning in EFL classrooms with slow internet : Insights from teachers and students. *Researchgate.Net*, *October 2018*, 68–79. https://www.researchgate.net/publication/330400197_BLENDED_LEARNING_IN_EFL_CLASSROOMS_WITH_SLOW_INTERNET_INSIGHTS_FROM_TEACHERS_AND_STUDENTS

Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., Barman, B., Das, P., & Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. *Children and Youth Services Review*, *116*(June), 105194. https://doi.org/10.1016/j.childyouth.2020.105194

Kennedy, T. J., & Odell, M. R. L. (2014). Engaging students in STEM education. *Science Education International*, *25*(3), 246–258.

Kumar, M. (2020). *New face of education sector post Covid-19*. *25*(10), 1–6. https://doi.org/10.9790/0837-2510070106

Lisa, M., & Robert, M. S. (2008). I will do it tomorrow. College Teaching, 57(5), 21-2154.

Magsambol, B. (2020). No student left behind? During pandemic, education 'only for those who can afford'. Rappler. Available online. https://rappler.com/newsbreak/in- depth/education-only-for-people-who-can-afford-coronavirus-pandemic.

Magsambol, B. (2020). Over 200,000 students transfer from private to public schools amid pandemic. https://rappler.com/nation/students-private- schools-transfer-to-public-coronavirus-pandemic. Date Accessed, 18 July 2020.

Malley, L.O. (2020). The challenge of continuing active learning in STEM in an online classroom**.** *Insight into Diversity:* https://www.insightintodiversity.com/the-challenge-of-continuing-active-learning-in-stem-in-an-online-classroom/

Mcclurg, L., & Morris, R. (2014). Shaping student behaviors through reward systems: Lessons from beaver trapping? *Journal of Higher Education Theory and Practice*, *14*(2), 89–102. http://www.na-businesspress.com/jhetp/mcclurgl_web14_2_.pdf

McDonald, K. (2020). Parenting in a time of COVID-19. Lancet, 395:e64. https://doi.org/10.1016/S0140-6736(20)30736-4

Miradora, J. F., Pangilinana, M. K. A., Sevilla, M. R., & Tolosa, K. (2020). Ensuring education continuity in the time of Covid-19. *Coalitions for Change (The Asia Foundation)*

Moorhouse, B. L. (2020). Adaptations to a face-to-face initial teacher education course 'forced' online due to the COVID-19 pandemic. *Journal of Education for Teaching*, *00*(00), 1–3. https://doi.org/10.1080/02607476.2020.1755205

Naimie, Z. & Siraj, S. (2010). Hypothesized learner's technology preferences based on learning style dimensions. *The Turkish Online Journal of Educational Technology*, 9(4), 83-93.

Onyema, E. M. (2020). Impact of coronavirus pandemic on education. *Journal of Education and Practice*, *11*(13), 108–121. https://doi.org/10.7176/jep/11-13-12

Özer, Uzun B., Saçkes, M. (2011). Effects of academic procrastination on college students' life satisfaction. *International Conference on Education and Educational Psychology (ICEEPSY 2010), Volume 12, pages 512-519.* https://www.researchgate.net/publication/241123202

Pe Dangle, Y. R., & Sumaoang, J. D. (2020). The implementation of modular distance learning in the Philippine Secondary Public Schools. *Icate*, 1–9

Rhew, E., Piro, J. S., Goolkasian, P., & Cosentino, P. (2018). The effects of a growth mindset on self-efficacy and motivation. *Cogent Education*, *5*(1), 1–16. https://doi.org/10.1080/2331186X.2018.1492337

Reyes, R. S. E., Almendral, F. S. N., & Rubi, R. B. (2019). *Personal , social and academic challenges : Basis for developing an intervention program*. *7*(4), 132–142.

Rice, K. G., Lopez, F. G., & Richardson, C. M. E. (2013). Perfectionism and performance among STEM students. *Journal of Vocational Behavior*, *82*(2), 124–134. https://doi.org/10.1016/j.jvb.2012.12.002

Rincon, B. E., & George-Jackson, C. E. (2016). STEM intervention programs: funding practices and challenges. *Studies in Higher Education*, *41*(3), 429–444. https://doi.org/10.1080/03075079.2014.927845

Rodriguez-Segura, L., Zamora-Antuñano, M. A., Rodríguez-Reséndiz, J., Paredes-García, W. J., Altamirano-Corro, J. A., & Cruz-Pérez, M. Á. (2020). Teaching challenges in COVID-19 scenery: Teams platform-based student satisfaction approach. *Sustainability (Switzerland)*, *12*(18), 1–29. https://doi.org/10.3390/su12187514

Roksa J., and Kinsley, P. (2019). Ej1216398. *Eric-Education Resources Information Center.* https://-//eric.ed.gov/?id=EJ1216398

Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. Internet and Higher Education, 5, 319-332.

Saavedra, J. (2020). Educational challenges and opportunities of the Coronavirus (COVID-19) pandemic. https://blogs.worldbank.org/education/educational-challenges-and-opportunities-covid-19-pandemic

Saykılı, A. (2018). Distance education: Definitions, generations, key concepts and future directions. *International Journal of Contemporary Educational Research,* 5(1), 2-17.

Shazia, N., & Muhammad Saqib, K. (2015). *The Impact of time management on the students ' academic achievements*. *11*(January 2015), 66–72. t: https://www.researchgate.net/publication/313768789

Shwartz-Asher, D.; Reiss, S.R.; Ali, A.A.Y.; Dori, Y.J. (2010). Engineering teachers' assessment knowledge in active and project-based learning. in active learning in college science; Mintzes, J., Walter, E., Eds.; Springer: Cham, Switzerland

Sintema, E. J. (2020). Effect of COVID-19 on the performance of grade 12 students: Implications for STEM education. *Eurasia Journal of Mathematics, Science and Technology Education*, *16*(7), 1–6. https://doi.org/10.29333/EJMSTE/7893

Stake, R. (1995). The art of case study research. Thousand Oaks, CA: Sage.

Toquero, C. M. (2020). Challenges and opportunities for higher education amid the covid-19 pandemic: The Philippine context. *Pedagogical Research*, *5*(4), em0063. https://doi.org/10.29333/pr/7947

Tria, J. Z. (2020). The covid-19 pandemic through the lens of education in the Philippines: The new normal. *International Journal of Pedagogical Development and Lifelong Learning*, *1*(1), ep2001. https://doi.org/10.30935/ijpdll/8311

UNICEF. (2020). *Guidance On Distance Learning Modalities To Reach All Children And Youth During School Focusing on low- and no-tech modalities to reach the most marginalized*. https://www.unicef.org/rosa/media/7996/file/Guidance%20Continuity%20of%20Learning%20during%20COVID-1

Villar, I. (2009). Implementing a comprehensive guidance and counseling program in the Philippines. Aligned Transformations Publications. ISBN 978-971- 940-1-4

Walker, E. T., & McCarthy, J. D. (2010). Legitimacy, strategy, and resources in the survival of community-based organizations. Social Problems, 57(3), 315–340

Yılmaz, Ö., & Malone, K. L. (2020). Preservice teachers perceptions about the use of blended learning in a science education methods course. *Smart Learning Environments*, *7*(1). https://doi.org/10.1186/s40561-020-00126-

Yin, R. K. (2009). Case study research: Design and method (4th ed.). Thousand Oaks, CA: Sage.

Copyrights