

# Challenges Faced By Mathematics Teachers in Teaching Algebra in a Modular Learning Approach

Emybel M. Alegre, Ph.D., and Marie Celine Adelantar

**Abstract:** This paper aims to identify the challenges faced by grade 7 Mathematics teachers in teaching algebra through the modular-based approach of teaching during this time of the pandemic. The researchers utilized questions answered by the participants to know the challenges faced, and the strategies and training undergone for the new educational system. The researchers used random sampling in the data gathering. Thematic analysis is employed for the data interpretation. According to the findings, one of the challenges of educators is they have difficulty meeting the individual needs of the students in teaching algebra. They find out that letting their students ask a question regarding their modules is one of the best strategies to overcome the difficulty they are facing. This strategy helps them motivate their students who show low interest in schoolwork. Additionally, Webinars for teaching Algebra are one of the professional development programs and training for teachers to overcome challenges in the Modular learning approach. It shows that teachers are having difficulties in this new normal setting as to how are they going to give the quality of education as how the traditional face-to-face class is conducted.

**Keywords:** Mathematics Teacher, Teaching Algebra, Modular Learning

## 1.0 Introduction

Our country is greatly affected by the COVID-19 pandemic many are infected and deceased. This pandemic is very alarming not only in the Philippines but all over the world. According to Moralista and Oducado (2019), internationally

there are 9,472,473 confirmed COVID-19 cases by the World Health Organization, and the Philippine Department of Health has recorded more than 30,000 COVID-19-positive cases. Due to this pandemic, the mode of our educational system was changed starting from the school year 2020-2021 due to the COVID-19 Pandemic. The Department of Education and the Commission on Higher Education implemented the new mode of learning to ensure the safety of every learner. Faculty of Higher Education Institutions have to be supplied with continued help and education as they adapt to the new ordinary in the greater training landscape and as they include the instructional challenges delivered by all means due to the Coronavirus disease 19 pandemic (Toquero, 2019). As a result of the pandemic, Modular Distance Learning has been implemented as an immediate response to ensure educational continuity. (Rave et al., n.d.)

Furthermore, the modular approach is a modern way of thinking about education that moves away from conventional methods of instruction and toward an outcome-based learning model. Modularization is based on the idea of breaking down a curriculum into small discrete modules or units that are self-contained, non-sequential, and typically limited in length. (The practice of modularized curriculum in higher education institution: Active learning and continuous assessment in focus, 2019)

A modular approach is a self-contained package that covers a single topic in a convenient format, allowing the

learner to complete it at his or her own pace in small groups. It is so well-structured that the learner can define the goals, choose materials and methods, and assess his performance. Additionally, the modular approach to learning mathematics is an important and efficient method for assisting students in learning mathematics on their own. (Charles, 2021). In line with this, the use of a modular approach as a remedial teaching material, such as the Quadratic Function, significantly improved students' achievement levels, especially in the experimental community. There is a statistically significant difference in achievement levels between the experimental and control groups after remedial teaching is completed. (Melad, 2016). Hence, the researcher wanted to determine the challenges experienced by the mathematics teachers teaching algebra in a modular learning approach.

## Statement of the Problem

This study aims to identify the difficulties and challenges of Grade seven (7) math teachers and their coping strategies. However, the researchers came up with these questions:

1. What are the challenges the teachers encountered in teaching algebra  
Modular-Based Approach?
  - a. Intrinsic challenges/ personal challenges
  - b. Extrinsic challenges
2. What are the strategies of the participants to overcome the challenges encountered?
3. How does the strategy help in teaching algebra in the modular-based approach?

4. Based on the result of the study, what teachers' training programs in modular instruction are helpful for teachers to overcome challenges in the modular learning approach?

## 2.0 Theoretical Framework

This theoretical framework is useful to identify the difficulties and challenges of grade seven (7) teachers in Agusan National High School. Since the educational system is changing because of the Covid-19 pandemic, the learning process is also changing. Furthermore, based on the study conducted by (Hamidreza Kashefi et al., 2017) entitled Teaching and Learning Theories Applied in Mathematics Classroom among Primary School Teachers that Behaviorism by John B. Watson in which Behaviorism focuses on observable behavior, which inevitably contributes to the rote learning process. To promote mathematics growth in a successful classroom, teachers must also help students cultivate a passion for mathematics by providing engaging examples from everyday life.

Connectivism is a teaching and learning philosophy popular in the twenty-first century. Downes discovered that community awareness can help teachers and students form experiences and actions. The information that interacts within the network is referred to as community knowledge. Teachers' positions have shifted in the connective classroom from expert "input or response giver," "spoon feeder," or recognized as conventional mathematics activities such as repetition and memorization, to the facilitator, listener, observer, and organizer. (Hamidreza Kashefi et al., 2017).

In Lev Vygotsky, student-teacher collaboration methods are supported through the Zone of Proximal Development theory. ZPD is what learners need to do independently and with the assistance or guidance of the teacher or through peer collaboration (Hodora, 2011). In connection with Lev Vygotsky, Bruner, Wood, and others scaffolding situations are those in which the learner gets assistance or support to perform a task beyond his or her reach if pursued independently when "unassisted" (Pea, 2013).

## 3.0 Methodology

This study used the descriptive qualitative method design through adopted interview questions from the Organization for Economic Co-operation and Development (OECD), 2013 as the main instrument in collecting the data, backup interviews with the participants will be conducted to gather more data information. Answering "what" and "how" questions were appropriate to the research design. The result of the data was analyzed to determine and identify the challenges of Grade seven (7) mathematics teachers teaching algebra in a new normal setting.

This study was conducted at Agusan National High School, Main Campus located at A.D Curato Street, Butuan City. It was estimated at 6.6 km. away from Caraga State University. Agusan National High School has been reached by riding a motorcycle, jeepney, and other forms of land transportation. The participants of the study were Grade seven (7) mathematics teachers teaching algebra subjects in a modular-based approach. The researchers interviewed 50 percent of the total population by random sampling.

## 4.0 Results and Discussion

This chapter presents the data collected about the challenges encountered by the Grade seven (7) Mathematics teachers teaching algebra in the Modular-Based Approach. The researchers analyzed and interpreted the data based on the result collected from the five (5) Grade seven Mathematics teachers in Agusan National High School, Butuan City.

### Research Question 1: What are the challenges the teachers encountered in teaching algebra in the Modular Based-Approach?

The challenges of the Grade Seven (7) Mathematics teachers were gathered through a survey questionnaire with a backup interview. A new mode of learning has greatly affected the educational system of the Philippines where the teachers encountered challenges in giving quality education to their students. The following were the final themes of the challenges encountered by the participants.

#### Theme 1.1 Meeting the needs of the students in teaching algebra.

The modular-based approach is a new way of teaching students amid the pandemic. Teaching algebra with a modular approach is one of the challenges that teachers are facing today. The following statements support the claim about the personal intrinsic related difficulties of the teachers in teaching algebra lessons

*"I find it hard to meet their needs jud language. I find it challenging seeing lots of my students returning their modules, especially as Math nga incomplete and uban kay unanswered jud. "Participant 1.*

*Translation: ["I find it hard to meet the needs of the students. I find it challenging seeing lots of my students returning their modules, especially in Math incomplete and some are unanswered."]*  
*Participant 1.*

*"When students returned their modules unanswered, doubtful jud ko Kung naa ba silay nasabtan or wala kay some of them did not answer the*

*activities and exercises on their modules.” Participant 4.*

*Translation: [ “When students returned their modules unanswered, I’m so much doubtful in their learnings are authentic or not because some of them did not answer the activities and exercises on their modules.”] Participant 4.*

As the data was gathered, some of the teacher-participants said that they are having difficulty meeting the needs of their learnings, especially in math through a printed modular approach. And some said they are to the learnings of the students in returning their modules incomplete and unanswered. Based on the study of Sikwibele and Mungoo (2009) teachers clarified that students faced many difficulties during their studies. The key issue mentioned was the lack of learners’ help. Addressing these issues and raising awareness of the educational environment in which our teachers and kids work daily will assist to enhance teacher retention student success rates, and the overall quality of education in our school (Meador 2009). which researchers find true because accordingly, teachers should assist students for them to assure the students learning in their math lessons.

#### **Theme 1.2. Preparations, Distributions, and Retrieval of Modules.**

Teachers are the ones struggling with the modular-based approach to learning. Since the COVID-19 pandemic threatens the lives of everyone it also affects the system of our education. The following statements support the claim of extrinsic challenges of the teachers, especially in the preparation distribution, and retrieval of modules.

*“Actually, ang preparation sa modules kay time consuming jud siya. Sa pag organise ug sa pag stapler sa mga modules. Ug during a distribution as modules kay naay mga students and parents get their modules late than the given schedule. Ug sa retrieval a module kay naa pud students nga dili dayun ka submit sa ila modules.” Participant 2.*

*Translation: [“Preparation of the modules is time-consuming. In organizing them and stapling them together. During the distribution of modules, some students and parents get their modules late than the given schedule. And lastly, the retrieval of modules, there are students submitted their modules late.”] Participant 2.*

*“Some parents are hard to be contact, during bitaw sa among pag distribute sa module kay inactive ang numbers nga gihatag sa students. Pero ang uban kay updated man sab through sa gc namo. Pero mao lagi gihapon naa gihapon students nga basta makapasa lang modules on time*

*bisan ug dili complete.” Participant 5.*

*Translation: [ “Some parents are hard to contact, during the distribution of the modules some of the contact numbers are inactive. But with the help of our group chats in messenger, the students are getting updated. But there are still students who submitted their modules on time but incompletely.”] Participant 5.*

From the data gathered, it was shown that teachers are also having difficulties with the preparation, distribution, and retrieval of modules. The following are the extrinsic challenges that teachers encountered in the modular-based approach of teachers. It relates to the study of Cabardo 2022, that teachers face a variety of issues with modular distance learning, including time constraints due to learners submitting incomplete and inaccurate modules. Unanswered modules were insufficient parental support and insufficient training to effectively use the learning modality in teaching and learning.

#### **Research Question 2: What are the strategies of the participants to overcome the challenges encountered?**

The following presented are the coping strategies of the Grade 7 Mathematics teachers to overcome the challenges encountered.

#### **Theme 2. Encourage the students to ask**

Participants found out that letting their students ask questions regarding their modules is the key to overcoming the challenges they encountered. The following statement supports the claim of the strategies of the teachers.

*“For me, it could help if the students ask questions, especially in the Math related lessons kay makahatag man gud hint Kung asa nga part sila maglisod.” Participant 1*

*Translation: [“For me, it could help if the students ask me questions especially in Math related lessons because it gives me hint in what part they have difficulty learning.”] Participant 1*

*“To overcome these challenges, I just accept the reality brought by this new normal mode of learning. Of course, just keep doing the tasks and remaining positive are essential. Ug isa pa malipay pud ko kung ang ako studyante kay permi mang inquire about sa updates sa school ug even sa ilang mga modules nga lisod answeran samot na anang Math.” Participant 2.*

*Translation: [“To overcome these challenges, I just accept the reality brought by this new normal mode of learning. Of course, just keep doing the tasks, and remaining positive is essential. And one thing is that I would be good also if my students would inquire about school updates and even on their*

*difficulties in answering their math modules.”]*  
*Participant 2.*

*“I always encourage jud my students to feel free to ask questions especially if it is related to their Mathematics module kay para atleast matabangan nako sila sa pagsabot sa iyang lessons.” Participant 4*

*Translation: [“I encourage my students to always feel free to ask questions especially if it is related to Mathematics modules. At least I could be able to help them on understanding their lessons.”] Participant 4:*

It explains that despite the difficulty that the participants had encountered, they found strategies to overcome it. It implies that encouraging students to ask questions would help teachers gather ideas about the things they must do to be able to help their students.

It connects to the study of Vale (2013), Encouraging questioning helps to bring spirit into our educational system, and the art of asking good questions constitutes an important skill to foster for practicing mathematics.

**Research Question 3: How does the strategy help in teaching Algebra in**

**modular-based- approach?**

Teachers develop strategies for their students with their students. As mentioned, in theme 2, teachers encourage their students to inquire and ask questions strategy in facing challenges. The following are the themes on how the strategy helps the participants teach Algebra in a Modular Based-Approach.

**Theme 3. Motivates the students**

Participants found out that their strategy of encouraging their students to ask helps them to be motivated to study especially those students who show low interest in school. The following statements support the claim of the positive effect of strategy that teachers have.

*“Sa among nakita no, ang mga students nako kay mas mamotivate sila nga mas mukugi pa nga muanswer sa ilang modules, tungod kay*

*always man sila in touch sa amoa.” Participant 3.*

*Translation: [ As I observed, my students are more motivated to answer their modules because we are both keeping in touch with each other.] Participant 3.*

*“Malipayon ko nga maghuna-huna kay kadtong mga studyante nga murag wala gana mueskwela kay karon nakita na nako ilang*

*willingness mukuha ug muanswer sa ilang modules.” Participant 2.*

*Translation: [ I am happy to think that those students who show low interest in school are now eager and have the willingness to get their modules and to answer them.] Participant 2.*

As to the data gathered, the strategy that the teachers have as mentioned in theme 2.1 help them to make their students get motivated. It implies that encouraging students to ask is a good strategy for teachers to keep in touch with their students. Especially, those students who show low interest in school. It connects to the study of Johnson (2017), Student’s motivation is not solely responsible for their learning. Teachers can improve students’ motivation to learn by fostering autonomy, relevance, relatedness, competence teacher’s enthusiasm for the subject, and self-efficacy. While motivation can be intrinsic or extrinsic, teachers must establish an environment that encourages students to study.

**Research Question 4. Based on the result of the study, what teachers’ training programs in modular instruction are helpful for teachers to overcome challenges in the Modular learning approach?**

One of the important aspects of giving a good quality education even amid the COVID-19 pandemic is to upskill teachers. Specifically in teaching Algebra to students through a modular approach. For them to be more prepared for the implementation of this new modality of education. The presented are the training and programs for teachers in teaching algebra to overcome the challenges brought by the Modular Learning Approach.

**Theme 4. Webinars for teaching Algebra**

In this new normal setting of the educational system, there are many adjustments and changes have been implemented. There are challenges to it and at the same time, there are new professional programs for our teachers. Participants had undergone webinars for teaching Algebra which they found helpful for them to overcome the challenges they encountered. The following statements support the claim of helpful training and programs for teachers.

*“DepEd provides us orientation and training on distance learning. And I think that one of the most helpful specifically on teaching Algebra kay kadtong webinar namo for teaching Algebra sa Karon nga modality so atong educational system.” Participant 1*

*Translation: [ DepEd provides us orientation and training on distance learning. And I think that one of the most helpful specifically on teaching Algebra is our webinar on teaching Algebra in this new modality of our educational system.] Participant 1*

*“Yuh, training are important jud sa amo nga mga teachers especially we have lots of changes sa atong modality sa pag teach. Well, for me kay kadtong webinar in teaching Algebra man siguro to ang isa sa helpful trainings namo sa pagtudlo sa math labi na sa*

*Algebra. “Participant 4*

*Translation: [ “Yuh, training is really important for us teachers especially since we have lots of changes in our teaching modality. Well for me, webinar in Teaching Algebra is one of our helpful training in teaching Mathematics, especially in Algebra.”] Participant 4*

As to the data gathered, the helpful training for the teachers is the webinars for teaching Algebra. It helps them to upskill their knowledge and competence to give a quality education despite the challenges they encountered. It connects to the study of Gegenfurtner & Ebner (2019), Teachers, lecturers, trainers, technologists, and theorists interested in computer-assisted design, implementation, delivery, tutoring, and evaluation of webinar-based learning environments. In addition, according to Allred & Smallidge (2010), Extension specialists from other disciplines can benefit from the use of webinars as a teaching medium. The benefits of webinars include the increased ability for participants to obtain information at a time and location that is convenient for them. The host and speaker, whom both had similar advantages, can save the audience money and time by avoiding the costs and risks of travel, and who can provide easy and inexpensive access to electronic resources to the audience Webinars provide access to speakers whose jobs don't always enable them to travel, but who can use technology to overcome geographic restrictions.

## 5.0 Conclusions

The challenges encountered by teachers in teaching algebra in a modular-based learning approach have been determined in this study. This difficulty led to the solution of providing better learning strategies through webinars. The teachers are having difficulty meeting the needs of the students in teaching algebra through a modular-based approach.

The results presented show that the teachers came up with teaching strategies that help them cope with the challenges they encountered. Letting the students ask questions and queries regarding modules is one of the common strategies that the teacher fosters. Furthermore, from the strategy that has been used by the teacher, we can conclude that it helps teachers motivate students who show low interest in schoolwork.

This study suggests that teachers undergo webinars for teaching algebra in a modular learning approach. The result shows that webinars are one of the professional

development programs and training for teachers that provide additional teaching strategies as part of the adjustments and changes in the new normal of education.

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