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Readiness levels and challenges of secondary mathematics teachers in implementing modular distance learning in the new normal

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Abstract

The study investigated the extent of readiness, challenges met concerning instructional materials, teaching approaches and assessment, the relationship of readiness level and challenges met of the participants, contingency plan of the Modular Distance Learning (MDL)-related problems in the new normal. Frequency counts and percentage distribution were used in profiling while net agreement rating was used to measure readiness levels and challenges met by the participants in instructional materials, teaching approaches, and assessment. Relationships and/or associations between profile variables and teachers' readiness level, the MDL challenges level were tested using Spearman Correlation and Chi-Square Test of Independence. The participants disagree with five indicators in challenges in instructional materials and four indicators in teaching approaches. Among all the profile variables, the number of students handled, and the number of trainings attended showed a relationship to the challenges met by the participants in instructional materials; gender is associated with the challenges in teaching approaches while the number of years in teaching and number of relevant trainings attended is related with the challenges in teaching approaches. Challenges in assessment is seen as strongly related to teachers' readiness in implementing modular distance learning. Also, the challenges in instructional materials and teaching approach both moderately related to teacher's readiness in modular distance learning.

Keywords: Modular distance learning in the new normal, teacher's challenges, teacher's readiness

Introduction

The global outbreak of the Corona Virus Disease, also known as CoViD-19, poses numerous challenges as vaccine to stop this highly contagious virus is not yet discovered. Due to its encompassing threat, there has been a massive closure of schools in the country as one of the government's precautionary measures to avoid the widespread of CoViD-19 pandemic. This sudden and unexpected closure affected millions of learners around the country especially in the accomplishment of the set activities of the Fourth Quarter for the S.Y. 2019-2020.

The disruption caused by this pandemic has forced the educational leaders to shift to different modalities in teaching that does not require physical or face-to-face interaction. The DepED Order No. 12, s. 2020 or the Adoption of the Basic Education Learning Continuity Plan (LCP) for School Year 2020-2021 in Light of the COVID-19 Public Health Emergency was released on June 19, 2020 to better address the current educational dilemma. The goal of this is to find ways for learning to continue amidst the threat and uncertainties brought about by COVID-19, while ensuring the health, safety, and well-being of all learners and teachers.

In the case of the Division of Bayugan City, Distance Learning as Alternative Delivery Modalities (ADM) will be offered for the S.Y. 2020-2021. The Modular Distance Learning is opted by most of the schools in the said division. This modality entails modified self-learning education that permits learners to make use of self-learning modules (SLMs) in print, digital format or electronic copy. Under the modular distance learning, materials can be distributed by print or in digitized form. This type of modality is convenient especially to the students who cannot readily access internet connection and it does not involve sophisticated programming and instructional design.

Although with its advantages, there are also cited numerous limitations on instructional materials, learning experience, teaching approaches, and timely feedback. Firstly, the instructional materials in this modality often lack high quality or interactive content and lacks real-life experiences. The key issues that surfaced regarding the extent of readiness of the basic education schools were a lack of school money for module creation and delivery, learners' struggles with self-study, and parents' lack of understanding to intellectually assist their child/children (Dangle & Sumaoang, 2020). Further, the reproduction cost a lot and the budget is only limited. Teachers' productivity in the production of modules is hampered by a lack of printing materials and resources (Castroverde & Acala, 2021). Secondly, the learning experience and success is contingent upon the high of literacy or enjoyment in reading and it is disadvantageous to struggling learners who learn best in other modalities. Thirdly, the application of teaching approaches is often limited since the teaching responsibility is handed over to the parents of the students. It became difficult for the teacher to authenticate the actual performance of the student because some have tutors while others do not learn on their own (Castroverde & Acala, 2021). Lastly, the delayed and untimely feedback can be an obstacle in gauging student's learning. Teachers find it difficult to tell students about the state of their learning and to provide feedback on students' outputs (Castroverde & Acala, 2021).

There are certain challenges involved in distance learning such as various distractions (due to lack of teacher control over the situation), lack of technical skills by teachers and, less so, by students, lack of social interaction between students, quality of both teaching and learning, which may be worse than in traditional education, the need in taking measures to discipline and organize students, less personalized contact with teachers, less individual approach to students (if any), less culture-sensitive approach, few or no cooperatively done tasks, lower quality of interactions (they are superficial), no socializing on campus, and difficulty in getting teacher's scaffolding (Doghonadze,2020). These things emphasize the absence of the teacher's abilities and equipment such as reliable instructional

materials, appropriate teaching approach to help the struggling learners, and the efficiency of assessment tools needed for a learner.

With these challenges and the preparation set by the teachers in the school year 2020 - 2021, this study aims to identify the extent of readiness of secondary Mathematics teachers and their challenges in Modular Distance Learning.

Conceptual framework

The knowledge of the subject matter, competencies and skills mostly depend upon the teachers' quality since attaining the goals of education requires qualified and highly literate teachers (Abd Hamid, Syed Hassan, & Ismail, 2012). Having in-depth knowledge of the subject matter helps teachers provide alternative explanations or use of different strategies to help students distinguish complex concepts (Kind, 2009). Also, teaching topics outside teacher's area of expertise influences teacher's pedagogical content knowledge as well as his attitude and self-confidence (Mizzi, 2013).

The stress brought about by COVID-19 pandemic steered educators to readiness in online education. Factors such as training, attitude, technical competence, time constraints, pedagogy, and methodology were among the major distance learning education elements (Phan & Dang, 2017). Regarding the readiness of DepEd Teachers to online teaching, it was shown that notwithstanding the inadequate knowledge in distance education such as technical capability, time management, knowledge and attitude in online schooling, they were still resilient with the trends in distance learning in the new normal (Ventayen, 2018). Moreover, readiness and satisfaction levels were also observed among prospective teachers in other countries like Turkey and Thailand in terms of web-based education (Ozturk, Ozturk & Ozen, 2018; Akarawang, Kidrakran & Nuangchalerm, 2015). Further, in the study on the response from the readiness of the online faculty of higher institutions in the United States, attitude and capability to teach virtually in terms of course design, course communication, time management and technical features most of the responses were scored high (Martin, Budhrani & Wang, 2019).

The change in educational system transcends oral teaching as the key to an effective pedagogy paving a path for teachers to develop instructional materials (Eshiet, 2013). The use of instructional materials improved the learning achievement in such a way that it enhances students' memory level. Teachers' knowledge has a great influence on the effective use of instructional materials because the teacher needs to understand the appropriateness of the teaching resources to fit the interest and deepen students' comprehension (Agu, 2011).

To improve students' achievement and cultivate lifelong learners, teachers need finding effective strategies for activating students' motivational levels. Many instructional approaches are compliant and can be utilized in service of several learning objectives. Strategies should be varied to fit with diverse learners (Davis, 2010). Strategies are used to surmount the disputes encountered such as knowledge capability of technical details and efficiency in teaching the subject (Child & Mc Ni Choll, 2007). Further, teachers with good content knowledge are more cognizant of the learners' challenges and misconceptions and were able to make use of strategies to stimulate conceptual shift (De Jong, et. al, 2002). On the other hand, teachers teaching outside subject specialisms followed the textbook structure quite thoroughly, could not impose engaging new activities, and asked recall questions (Mizzi, 2013).

Assessment has an important role in determining students' cognitive, affective, and psychometric skill. Appropriate assessment is also necessary to allow learners to make judgements and monitor their independent demonstration of knowledge, understanding and skills during learning process (Yan & Boud, 2021). It is used in different purposes in different

phases of instructional activities. Assessment really ties between teaching and learning (Wiliam, 2011). Because grades are used as assessment of student work and served as a source of impetus for continued learning and improvement, it is important that grades accurately mirror the quality of student performance and that student work is graded fairly (Walvoord and Anderson, 1998). Teachers must be equipped with knowledge in assessing and grading their students to avoid subjective grading.

Research objectives

Generally, this study identified the extent of readiness and the challenges encountered by the secondary Mathematics teachers in Bayugan City Division in Modular Distance Learning Modality. Specifically, this study seeks to answer the following objectives:(a) determine the profile of the participants; (b) determine the extent of readiness of the Mathematics teachers in implementing MDL; (c) determine the challenges experienced by the teachers in terms of instructional materials, teaching approaches and assessment; (d) relationship of profile variables to the challenges in instructional materials, teaching approaches and assessment; (e) relationship of teachers' readiness and the challenges encountered; and (f) teachers' solutions to address the concerns.

Methodology

Research design

This study employed the descriptive-correlational research to measure the extent of readiness and identify the challenges met by the secondary Mathematics teachers of Bayugan City Division amidst pandemic. Descriptive research was applied because this research determined the readiness levels of the participants as well as the list of challenges encountered in implementing the modular distance learning. Correlational study was also applied since this research determined the relationship and association of the challenges encountered and the readiness level of the participants in implementing the said modality. The personal profile of the participants in terms of baccalaureate program, math related trainings attended, math related subjects taken in the baccalaureate degree, subject/s taught, and teaching experience were also considered. Structured questionnaire was used in gathering the data from the participants to determine the readiness levels and challenges encountered by the participants in teaching mathematics during pandemic.

Respondents of the study

The participants of the study were the secondary Mathematics teachers of Bayugan City Division, Philippines during the school year 2020-2021. Complete enumeration was applied to extract teachers from the 11 public secondary schools in Bayugan City Division. The number of participants in this study were 26 males (59.1%) and 27 females (50.9%). The teacher-participants' age ranges from 20-55 years old. Most mathematics teachers lived in an urban area (54.7%) than in rural area (45.3%). Different perspectives could be gained from various teaching positions according to their functions in the fresh implementation of the modality. Thus, participants included in this study were the Teachers I, II, and III, Master Teachers I and II, and the Head Teacher III in the said division. A total of 53 secondary teachers participated in the survey.

Instrumentation

The data in the study was gathered via survey questionnaire. The researcher conducted a thorough review of related literature, including books and prior research papers, to ensure the suitability of the form and completeness of the data that would be obtained by this questionnaire.

The questionnaire had 4 parts namely: Part I (Personal Information), Part II (Teacher's Readiness), Part III (Challenges Met by Teachers), and Part IV (Solution to MDL-related Problems). Part I was about personal information such as name (optional), sex, age, number of relevant trainings attended in the past 18 months, number of teaching loads, number of students handled, educational attainment, teaching position, geographic location, and teaching experience. Part II was about teachers' resilience amidst pandemic in which it will be measured based on the 12 indicators on a 5-point Likert scale. Part III was about teachers' challenges in modular distance learning. This part comprises 3 sub-contents namely: instructional materials, teaching approaches, and assessment. Part IV consists of the solutions taken by the teachers regarding MDL-related problems as to instructional materials, teaching approaches, and assessment.

Validation and reliability

Before the administration of the survey instrument to the target participants, it was pre-tested among the selected faculty members of the Butuan City School of Arts and Trades, Butuan City, Agusan del Norte on December 2, 2020. The reliability coefficient of the survey instrument in the pilot study was good as indicated by the Cronbach's alpha obtained, α=.95. All items were retained as suggested by the results of the analysis.

Data gathering procedure

Prior to the survey, the researcher asked the approval from the Schools Division Superintendent and from the school principals of the different schools to conduct a research survey to the participants. This process was done to ensure the willingness and commitment of each school to participate in this study. Considering that limited face to face interaction, the conduct of the data gathering was done virtually. The data was gathered through online survey using google forms. After the survey, data were tallied, interpreted, and presented.

Data analysis

The data collated were tabulated and treated according to the problems presented in this study. Frequency counts and percentage distribution were used in determining the profile of the participants, while net agreement rating was used to measure teachers' readiness and the challenges met by the participants as to the instructional materials, teaching approaches, and assessment. Table 1 shows the interpretation on readiness and challenges of the participants.

Spearman-rank was used to determine the relationship between profile variables and the level of teachers' readiness and the level of challenges, and the relationship between teachers' readiness to their level of challenges; and Chi-square test of independence was used to determine the association between profile variables and the readiness and challenges.

Table 1. Interpretation on the readiness and challenges met by the participants.

Code	Qualitative Description	Remark
1	Below 0%	Disagree
2	0% - 9%	Neutral
3	10% - 29%	Moderate
4	30% - 49%	Good
5	50% - 69%	Very Good
6	70% and above	Excellent

To analyze the data, satisfying the assumptions of the correlation analysis was done. See Table 2 for interpretation of the strength of association of two categorical variables of Healey (2015), and Table 3 for correlation scale interpretation adapted from the study of Allevato (2019).

Table 2. Interpretation on the strength of association.

Association ϕ_c	Qualitative Description
Below 0.1	Weak
0.1 to 0.3	Moderate
0.3 and above	Strong

Table 3. Spearman-rank correlation scale

Negative	Level	Positive
≤-0.70	Very Strong	≥0.70
-0.69 to -0.40	Strong	0.40 to 0.69
-0.39 to -0.30	Moderate	0.30 to 0.39
-0.29 to -0.20	Weak	0.20 to 0.29
-0.19 to -0.01	Negligible	0.01 to 0.19

Findings and discussion

The following presents the data relative to the research problems stated in the first chapter of this study. The discussions of specific problems were presented sequentially as follows: profile of the participants, extent of readiness of secondary mathematics teachers in implementing modular distance learning, challenges experienced by the secondary mathematics teachers, relationship of profile variables and challenges met by secondary mathematics teachers in modular distance learning, relationship of challenges met and readiness of secondary mathematics teachers in modular distance learning, and planned solutions of the secondary mathematics teachers in implementing modular distance learning.

Profile of the participants

It is shown in Table 4 that there are more participants aged 30-39 years old who participated in the study. About 41.5% of the population in Bayugan City Division was composed of Mathematics teachers aged 30-39 years old. Slightly about three-fourths (73.58%) of the participants participated in the study aged 30 years or older, verifying that the preparation set by the teachers could not be assumed to be adherents of the ‘‘digital natives’ generation’’.

Table 4. Profile of the participants

		Frequency	%
Gender	Male	26	49.1
	Female	27	50.9
Age	20-29 years old	14	26.4
	30-39 years old	22	41.5
	40-49 years old	11	20.8
	50 and above	6	11.3
Type of Community	Urban	29	54.7
	Rural	24	45.3

Most of the rural areas in the city had low internet connection/ internet problem and cannot conduct online session to the learners. It is displayed that almost half of the participants are in rural areas (45.3%). With this, the participants assigned in the rural areas take the printed modular distance learning in observance of proper protocols implemented in the city. Strong and stable internet connection is required to conduct ODL but unfortunately, this will force teachers to install internet connection.

Table 5 shows the teaching profile of the participants who were handling MDL in the said division. Number of attended trainings, teaching loads (subject assignment), educational attainment, teaching position, and experience were gathered.

Table 5. Teaching profile of the participants

		Frequency	%
Number of Relevant Trainings Attended	0	13	24.5
	1 - 2	30	56.6
	3 or more	11	20.8
Number of Teaching Loads	1 - 2	3	5.7
	3 - 4	25	47.1
	5 - 6	24	45.3
	7 - 8	1	1.9
Educational Attainment	Finished College	5	9.4
	With units in Master's Degree	44	83.0
	Finished Master's Degree	4	7.5
Teaching Position	Teacher I	15	28.3
	Teacher II	25	47.2
	Teacher III	7	13.2
	Master Teacher I	4	7.5
	Master Teacher II	1	1.9
	Head Teacher III	1	1.9
Teaching Experience	1 - 5 years	15	28.3
	6 - 10 years	22	41.5
	More than 10 years	16	30.2

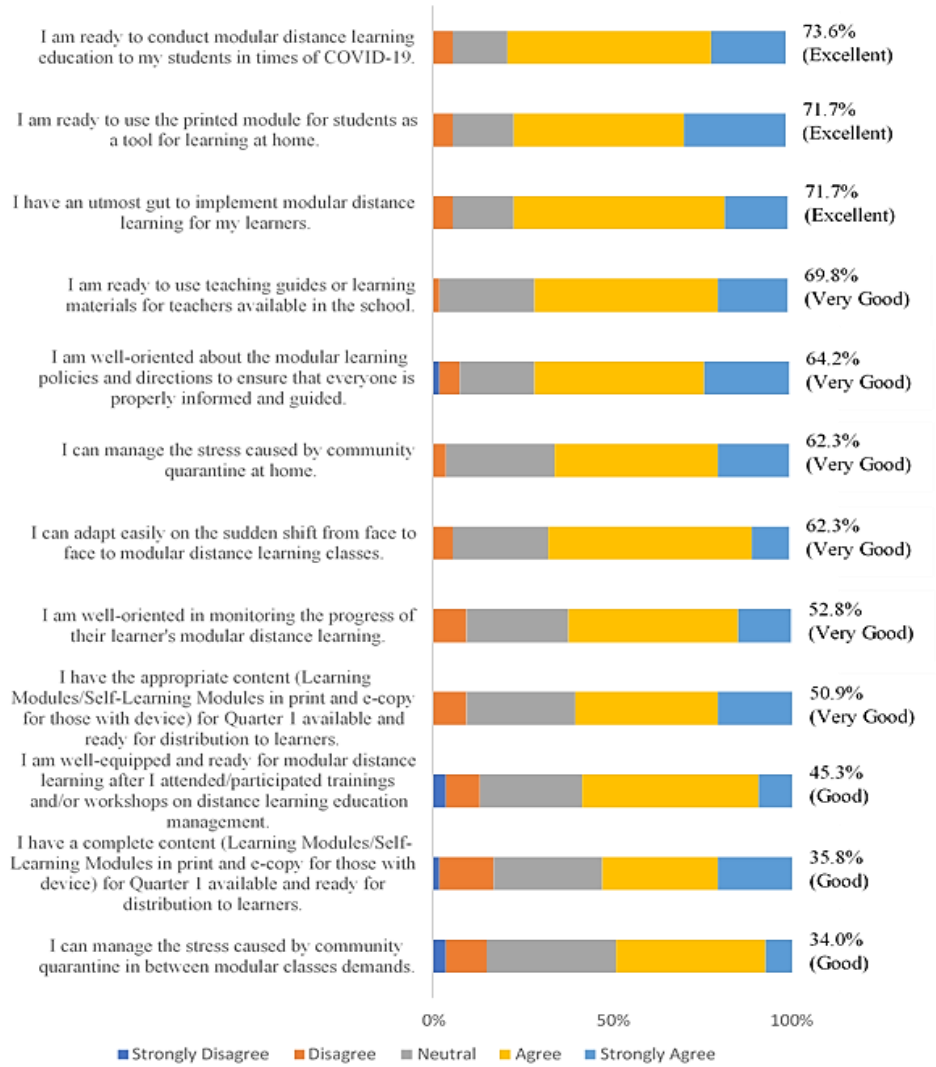
Majority of the participants (75.47%) are trained related to the modality institutionalized in their respective schools. While all teachers are still adjusting to new normal situation, seminars and conferences were transformed into webinars (web-based seminar). Most of the sessions and new lectures in different modalities were in the form of webinars. However, thirteen (24.5%) of the participants haven't oriented with any relevant trainings with regards to MDL because of their geographical location, where the internet connection is unstable, that influenced the extent of readiness and the level of challenges of the participants in the said division.

With the fresh implementation of MDL to the division, teachers must be required to attend MDL-related trainings to be equipped with the essentials to prepare in conducting the said modality. Challenges encountered by the teachers are discussed in the later part of the section. Majority of the secondary Mathematics teachers in the said division had an educational attainment with units in master's degree (83%).

Teaching experience referred to the number of years the respondent has taught in junior high school, senior high school, and/or college either public or private. In this study, most of the participants have 6-10 years of teaching experience and is followed with teachers having 1-5 years of teaching experience. In this study, it observes the relationship of teaching experience to the readiness of the participants taking MDL. A coherent study regarding distance learning situation mentioned that the length of teaching experience is much strongly correlated to readiness (Lapada, et.al, 2020). This implies that most secondary Mathematics teachers in Bayugan City Division were considered seasoned and were experienced in appropriate teaching methods in teaching Mathematics subjects. Their responses will be basis for the implications as to the net rating of the extent of readiness and as well as the challenges might experience by the teachers to implement new learning modality to students considering their length of teaching experience.

Extent of readiness of secondary mathematics teachers in implementing modular distance learning

Figure 1 presents the readiness level of the participants to handle MDL in the teachers in the division.



Legend: Percentages at the right indicate the net agreement rating and its corresponding remark

Figure 1. Extent of readiness of the participants

The extent of readiness of secondary Mathematics teachers in Implementing Modular Distance Learning (MDL) refers to the readiness level of the participants handling modular distance learning modality in Bayugan City Division despite pandemic crisis and stress in community quarantine. Note that a very good remark means that the participants hold the highest level of agreement with the statement. Also, a negative net agreement rating for agreement indicates disagreement with the given statement.

This shows that the participants had a high judgment that they are ready to teach Mathematics through MDL. The figure provides the net agreement rating and its

corresponding remark. The net agreement rating and the remark were the basis of determining the teachers' readiness in delivering distance learning education. Part of the research was the consideration of the new normal education wherein face-to-face classes are highly discouraged. The extent of readiness of the participants in implementing Modular Distance Learning as a modality for the new normal education is commendable. It is shown that the participants' agreement to statements have a good to very good remarks, bases for their readiness in implementing the modality. Particularly, the participants perceived that they were ready to conduct modular distance learning to the students in times of CoViD-19 pandemic (73.6%, Excellent). This means that the secondary Mathematics teachers were ready in delivering education despite the pandemic crisis and the challenge in distance learning.

This result coheres with a study that almost all participants responded "YES" when questioned whether they were prepared to perform distance learning modality during challenging times (Lapada, et. al, 2020). However, the participants described managing the stress caused by community quarantine in between modular classes demands as remarked as good but was the lowest net agreement rating in terms of readiness. Figure 1 shows the net agreement rating and the remark of the extent of readiness of the participants in handling modular distance learning to students considering the pandemic crisis.

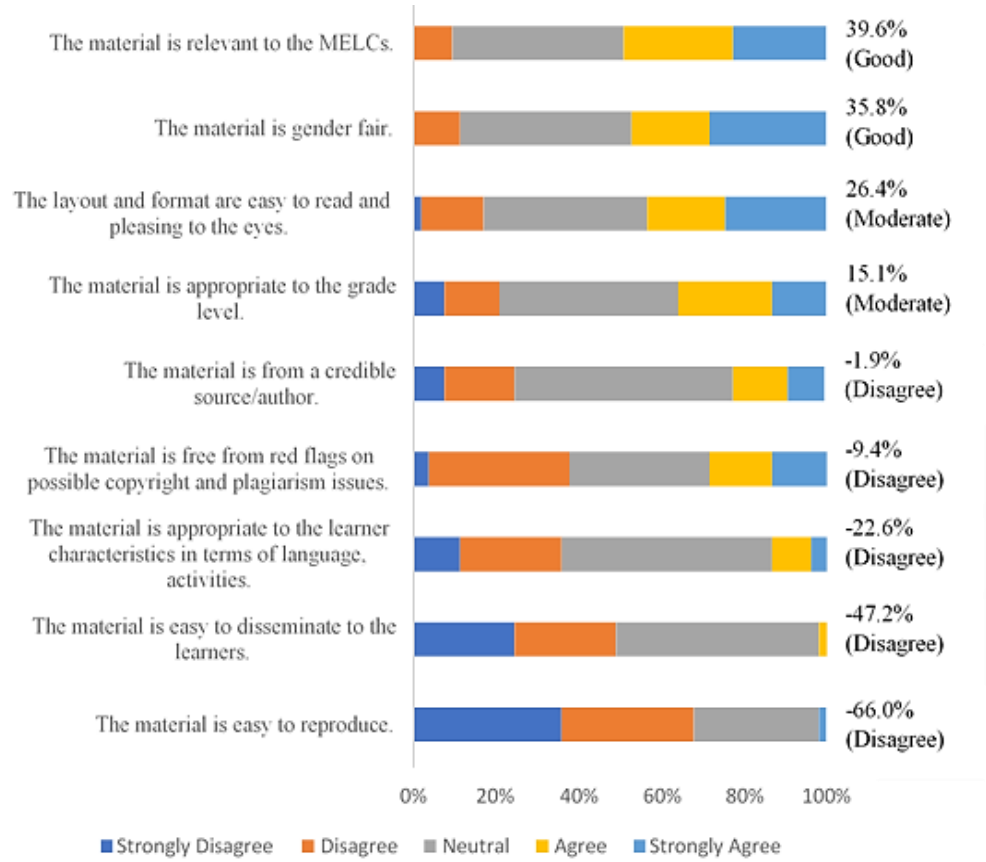
This implies that the teachers perceived that they could conduct the modular distance learning modality to students and are ready to implement it to learners with the requirements to be accomplished that were essential in the said modality. The teachers are ready to utilize the modules to be given to the students despite the community quarantine and the face-to-face restrictions.

Despite the challenges encountered in preparing the instructional materials intended for the said modality, teachers perceived to be ready in conducting modular distance learning. With the risk and hazard in implementing the modality due to distribution and retrieval of the printed material, considering the possibility of the means of transmission of the virus, the teachers were still persistent to implement the modality to educate learners despite the crisis encountered. Lastly, some of the participants tend not to agree with the statement that they had a complete content of the quarter 1 modules available to use, affecting the overall remark about the statement. The different Regions are in the last stage of completing module development as well as aligning earlier developed modules with the Most Essential Learning Competencies (MELCs).

Challenges experienced by the secondary mathematics teachers

Instructional Materials are essential in implementing modular distance learning which will be used by the teachers to distribute to the learners. Figure 2 showed the perceived challenges of the participants when dealing with instructional materials to be used in modular distance learning modality, as a medium of educational instruction. The secondary Mathematics teachers perceived challenges in some statements related to instructional materials.

Based on the data, teachers encounter the same challenges in the reproduction of modules. The situation in the division, teachers were instructed to create contextualized learning activity sheets. Also, teacher-participants experienced difficulty in disseminating the modules. The pressing demands of the time constraint and distance learning constraints upon implementation of modular learning is one of the considered factors by the participants. San Antonio said that schools and division offices may utilize "locally-developed SLMs." Several factors affecting the result such as several indicators influenced the perceived challenge in instructional materials of the participants.



Legend: negative net rating indicated disagreement of the statement

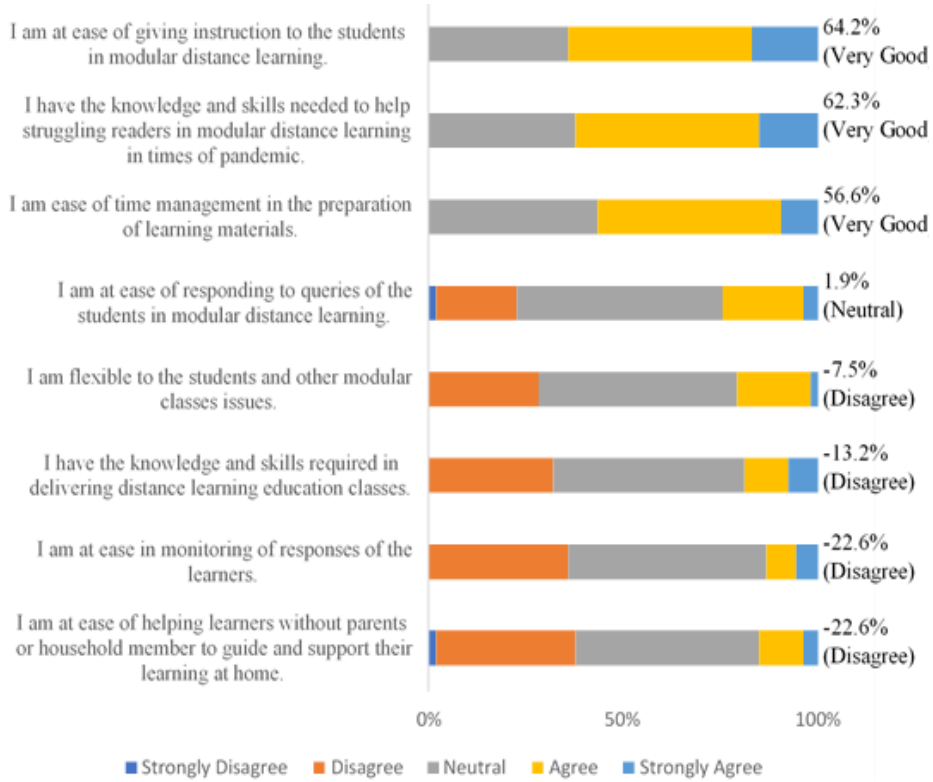
Figure 2. Challenges of the participants in using Instructional Materials

Overburdening pupils with learning activities leads to academic burnout and unhappiness. It is also important to avoid overloading the courses with activities in order to avoid academic burnout and stress (Bibon & Barcenas, 2021). However, there are also statements the participants tend to disagree to it and is perceived as challenges in relation to instructional materials were the appropriateness of its language and activities, and red flag issues. This means that teachers perceived challenges in learner appropriateness of the activities given. With this, the teachers consider a problem in creating appropriate activities which will not cause burnout to students due to its content inappropriateness.

Figures 3 and 4 show the challenges encountered by the teacher participants regarding teaching approaches and assessment in implementing MDL in the new normal. It is illustrated in figure 3 that there are greater number of statements the respondents tend to disagree or negative to the statements compared to the number of positive remarks.

The participants consider indicators the ease of helping learners without parents or household member to guide and support their learning at home, knowledge and skills required in delivering distance learning education classes, monitoring of responses of the learners, and flexibility to the students and other modular classes issues perceived challenging to participants in implementing teaching approaches amidst education implementation barriers. Being knowledgeable and skilled in implementing modular distance learning as perceived

moderately challenging is a problem in implementing the type of modality. The concerns of teachers engaged in teaching processes have been observed to be related to their capacities of conducting remote learning due to the level of their knowledge and skills in the use of technology, their access to technology, and at-home isolation.



Legend: negative net rating indicated disagreement of the statement

Figure 3. Challenges of the participants in Teaching Approaches

The teachers perceived challenge in helping the learners understand the topic in a week. The participants have difficulty in helping the learners understand the topic due to the circumstances prohibiting face-to-face interaction and thus, parents would be the means of transmitting the information coming from the teachers. However, as discussed that there are parents or guardians had hard time in helping the learners because of they did not understand the lesson too. There is a challenge as to how to connect to parents to help in facilitating learner's learning. This implies that implementing modular distance learning modality would require parents/guardians' participation in helping and facilitating learners. The abrupt transition to remote instruction posed significant problems for teacher's work (Boholano, et. al., 2021). The participants encounter challenge in monitoring the responses of the learners to the activities given. The issue regarding the reliability of the students' answers considered the teachers a problem if the learners really learned well with the topic provided that modular distance learning requires independent learning strategy.

Though there are no statement the participants perceived as very challenging in relation to assessment, it can be observed that the indicator in the last, remarked good, was

the least agreed by the participants. The statement as perceived by the participants pertaining to assessment and feedbacking to students was remarked good.

Majority of the indicators perceived by the participants have no problem with it or have not encountered any challenges to it. Additionally, majority of the secondary Mathematics teachers perceived less challenging in assessment given the restrictions in teaching the students due to pandemic crisis. It is shown in the figure that the participants have good responses to the statements given. But it is observable that the indicators having the least agreed by the teachers were considerable.

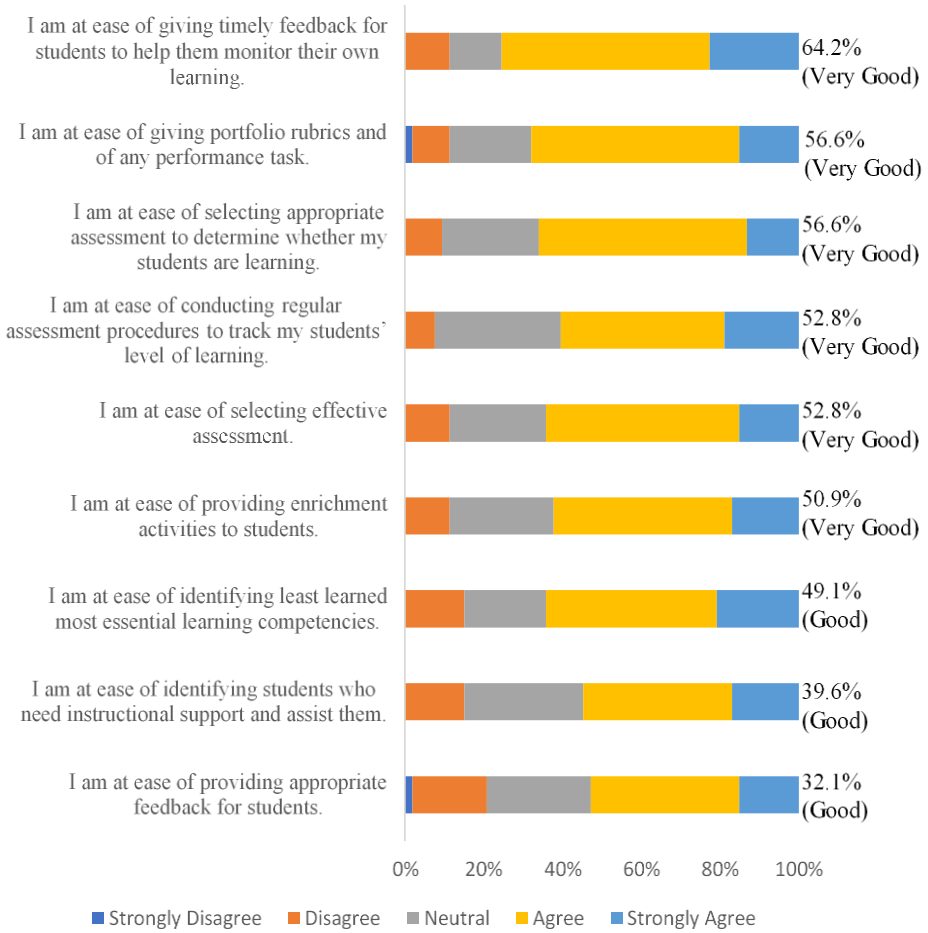


Figure 4. Challenges of the participants in Assessment

The statement as perceived by the participants pertaining to assessment and feedbacking to students was remarked good. This issue is related to the article stated that teachers are also worried and anxious that their students may not be the sole person accomplishing the activity sheets given (Bernardo, 2020). The secondary Mathematics teachers viewed the ease of assisting students needed with instructional support is not that agreeable considering the crisis. Lastly, the teachers perceived the least agreeable that it was easy to identify the least learned competencies in this new normal education.

Relationship of profile variables and extent of readiness of secondary mathematics teachers in modular distance learning

Table 6 shows the association and relationship of profile variables and extent of readiness of secondary Mathematics teachers implementing MDL in Bayugan City Division. Inspecting connections of profile variables and extent of readiness of the participants determine the association and relationship of the said variables. Spearman-rank correlation coefficient was used in determining the relationship of the variables, while Chi-square test of independence and was used to determine the association of the variables and Cramer's V was used to determine the strength of association.

Among all the profile variables, it was found out that gender was strongly associated, type of community was moderately associated, and number of teaching loads and number of relevant trainings attended were moderately related to the extent of readiness of the secondary Mathematics teachers implementing modular distance learning.

Table 6. Association and relationship of profile variables and extent of readiness of secondary Mathematics teachers in Modular Distance Learning

Variable 1	Variable 2	Degree of Relationship[a] or Association[b]	Remarks
Extent of Readiness	Gender	0.331[b]	Strongly associated
	Type of Community	0.227[b]	Moderately associated
	Number of Teaching Loads	-0.321[a]	Inverse-moderate relationship
	Number of Trainings	0.361[a]	Direct-moderate relationship

Legend: [a]using Spearman-rank correlation; [b]using Cramer's V

The number of teaching loads and number of trainings attended showed moderate relationship with the extent of readiness of the teachers implementing modular distance learning. It was discussed in a study that training is essential as teachers cannot automatically know how to teach effectively (Bernardo, 2020). This implies that when the teacher's assignment will be increased, their readiness to implement modular distance learning modality decreases. While it is wonderful that instructors face challenges with a positive attitude, it would be ideal to investigate ways of 'getting the work done' without jeopardizing teachers' physiological well-being, personal life, or professional self-concept (Ancho and Bongco, 2019). This also implies that when the teachers will be given more relevant trainings related to MDL, their readiness level increases.

A coherent study mentioned that gender and geographic setting have substantial variances with teachers' readiness to distance learning education (Lapada, et. al, 2020). This result can be complemented with other studies where it was reported that as per the international technology education standards in universities, female participants significantly vary in terms of technological knowledge, which is a prerequisite in implementing distance learning education (Alwraikat, 2017). It was reflected that the type of community the participants lived in was moderately related to their extent of readiness. Considering that there are almost half of the secondary Mathematics teachers were in a rural type of community (see Table 5), their extent of readiness varies when compared to urban areas. Rural areas lag when it emanates to accessing quality education as amenities and teaching and learning resources are mostly limited (Beiwinkler, 2020). From jarring teacher distribution and deficiency of school amenities — which makes the distance to school too distant for numerous students — to insufficient learning space.

Among all profile variables, gender and type of community were associated with the extent of challenges in IMs, teaching approaches, and assessment. Highest educational

attainment and number of teaching loads were related with extent of challenges in IMs, while the number of trainings attended is related with extent of challenges in teaching approaches.

Table 7 shows the association and relationship of profile variables and extent of challenges of secondary Mathematics teachers in implementing MDL. This is to determine whether profile variables were associated with the extent of challenges encountered while implementing MDL in the new normal.

Table 7. Association and relationship of profile variables and extent of challenges of secondary Mathematics teachers in Modular Distance Learning

Extent of Challenges	Gender	Type of Community	Educational Attainment	Number of Teaching Loads	Number of Trainings
Instructional Materials	Association is strong. 0.407[b]	Association is strong. 0.295[b]	Direct-moderate relationship 0.350[a]	Direct-very strong relationship 0.760[a]	
Teaching Approaches	Association is strong. 0.459[b]	Association is strong. 0.403[b]			Direct-moderate relationship 0.403[a]
Assessment	Association is strong. 0.374[b]	Association is strong. 0.320[b]			

Legend: [a]using Spearman-rank correlation; [b]using Cramer's V

The highest educational attainment of the participants is moderately related with their extent of challenges in instructional materials while the number of teaching loads has a very strong relationship with their extent of challenges in instructional materials in implementing modular distance learning modality. The number of relevant trainings attended showed moderate relationship with the extent of challenges in teaching approaches in modular distance learning. The teachers' gender and type of community is strongly associated with the extent of challenges in assessment in implementing modular distance learning modality in Bayugan City Division. This implies that when the teachers will be given more and more relevant trainings related to modular distance learning modality implementation, their challenges towards teaching approaches minimizes.

When the participants consider improving professional development, they will encounter less challenges in relation to instructional materials. Even knowledgeable and skilled teachers provoke great challenges each year, including variations in subject content, novel methods in instructions, technology advancement, altered laws and procedures, and student education needs and thus educators who were not involved and exposed in effective professional development do not expand their skills, and then compromised student learning (Mizell, 2010). Teachers' challenges in appropriate teaching approaches in modular distance learning modality had a connection with the teachers' gender and the community they were living. It was discussed in a study that the absence of high-caliper training, they will continue to repeat instructional approaches they used in their face-to-face classroom situations before the pandemic arise (Belastock, 2020). The relationship was also discussed that since teaching and learning mathematics varies on the teachers' proficiencies, training is essential as teachers cannot instinctively determine what and how to teach efficiently (Nyawira, 2015).

Teachers' gender and type of community is strongly associated with the extent of challenges in assessment in implementing modular distance learning modality in Bayugan City Division. There are challenges pointed out that affects teachers' challenges in assessment not mentioning the gender and type of community, challenges and apprehensions played to cut across core assessment types with the three broad themes appeared from the challenges being discussed: the influence of physical distance barriers of the teacher and student,

revisions consequential from the requirement of technology usage for students' communications, and work assignment and time management (Kearns, 2012). But, in the data presented, it showed that number teaching loads (workload) of the participants does not relate to teachers' challenges in assessment. This implies that teachers' challenges in assessment in modular distance learning modality had a connection with the teachers' gender and the community they were living.

Table 8 shows the relationship between the readiness of the participants and their challenges encountered in implementing a modular distance learning modality. As discussed in this chapter, the indicators in teachers' challenges in instructional materials, teaching approaches, and assessment are positive statements. When the teachers experience fewer challenges in instructional materials, teaching approaches, or assessment, the readiness level is high. On the other hand, more challenges mean low readiness. As discussed, the participants see no challenges in terms of assessment and their readiness level is already high. This implies that there was no sufficient evidence included in this study that depicts the relationship between teachers' readiness with the teachers' challenges in instructional materials. The teachers' challenges in teaching approaches and assessment are both moderately related to teacher's readiness in modular distance learning.

Table 8. Relationship of teachers' readiness and teachers' challenges in Modular Distance Learning (in terms of Net Agreement Rating)

Variable	Teacher's Challenges	Degree of Relationship	Remarks
Extent of Readiness	Using Instructional Materials	0.331	Strongly associated
	Teaching Approaches	0.227	Moderately associated
	Assessment	-0.321	Inverse-moderate relationship

Legend: [a]using Spearman-rank correlation; [b]using Cramer's V

The teachers' challenges in teaching approaches and assessment both moderately related to teacher's readiness in modular distance learning. The findings in the study of Sulaiman, Hamzah and Rahim (2017) showed that there exists a significant positive relationship amongst creative competence and readiness in teaching among schoolteachers. This means that when teachers' readiness with the modality implemented improves, their extent to teaching approaches improves. Additionally, when their readiness improves their extent to assessing students learning improves.

Solutions to MDL-related problems

Since there are challenges encountered by the secondary Mathematics teachers in implementing the modality, planned solutions will help in addressing these issues. The participants determined the solutions in resolving the MDL-related issues in terms of preparation, distribution, and retrieval of instructional materials; preparation, implementation, and feedback on Modular Distance Learning Modality; and preparation, implementation of assessment tools, and feedbacking of assessment results.

With the pressing challenges encountered by the participants concerning instructional materials (IMs), a contingency plan in the preparation phase was surveyed. The participants determined the solutions in resolving the MDL-related issues in terms of preparation, distribution, and retrieval of IMs; preparation, implementation and feedbacking on MDL; and preparation, implementation of assessment tools, and feedbacking of assessment results.

Figure 5 illustrates the planned solutions of the participants of the MDL-related challenges in instructional materials on the preparation phase.

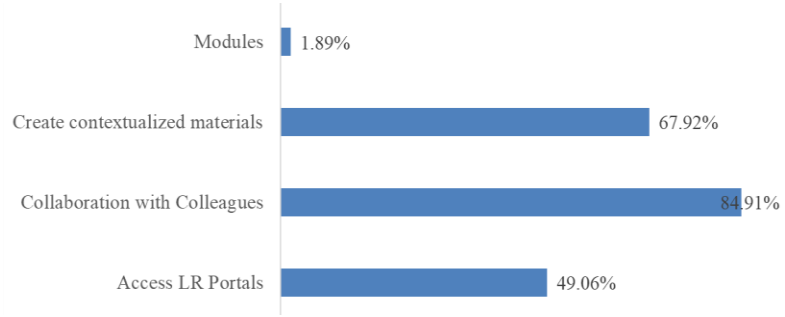


Figure 5. Planned solution of the participants for the Preparation Phase of the MDL-related challenges in Instructional Materials (*n*=53)

About 85% of the participants choose to collaborate with colleagues for the preparation of instructional materials. While the participants stressed out the disagreement of the statement that the material is easy to reproduce, collaboration with each other is their best choice. Given the limited span of time to reproduce thousands of copies with about 36-40 pages for a 1:1 learner-material ratio, number of workforces to accomplish this is the pulse of the secondary Mathematics teachers.

The pressing demands to deliver education to the respective homes of the learners is a top priority as a teacher. Although numerous challenges shouldered by the participants concerning instructional materials (IMs), a contingency plan in the distribution phase was surveyed. Figure 6 showed that all participants choose parent's involvement in the distribution of instructional materials is the solution to deliver modular distance learning to the students.

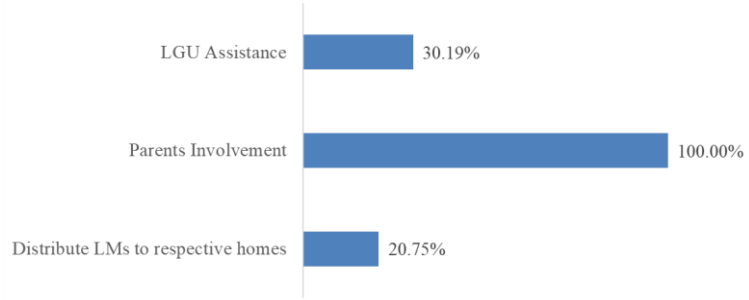


Figure 6. Planned solution of the participants for the Distribution Phase of the MDL-related challenges in Instructional Materials (*n*=53)

All participants choose parents involvement in the distribution of instructional materials is the solution to deliver modular distance learning to the students. Modular distance learning is the frequently occurring response favored by parents for the conduct of distance learning modality for the upcoming school year (Dangle & Sumaoang, 2020). In the same article, it is stipulated that in a distance learning approach, parents would be essential to simulate an active role in the learning process, where they would be any person to guide their children and facilitate through the modular instructions that would be distributed and assigned

to students while undertaking remote learning. This implies that the parents' involvement is crucial in order for this modality to work well.

The pandemic restricted the interaction of teachers and students where teachers experienced difficulty in retrieving the outputs of the learners. Figure 6 reveals the planned solution of the participants of the MDL-related challenges in Instructional Materials upon retrieval of modules and activity sheets.

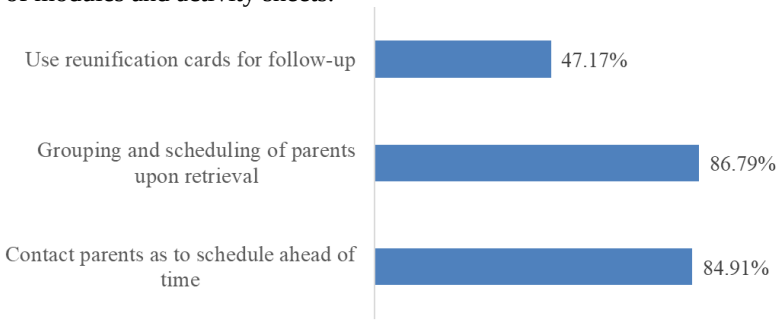


Figure 7. Planned solution of the participants for the Retrieval Phase of the MDL-related challenges in Instructional Materials (*n*=53)

The participants' plan is to group and schedule parents upon retrieval and contact parents as to schedule ahead of time. Since the parents are having work to earn for a living and are those also who will get the modules from the school, scheduling the parents as to when they will return the modules with the answers of the students. As parents are the best supporters in the school programs, giving them the best program practices in the modality used in the school must be planned properly.

Figures 8, 9, and 10 show the solution of the participants to address MDL-related concerns on applicable teaching approaches upon preparation, implementation, and feedbacking on the implementation of the modality in the new normal.

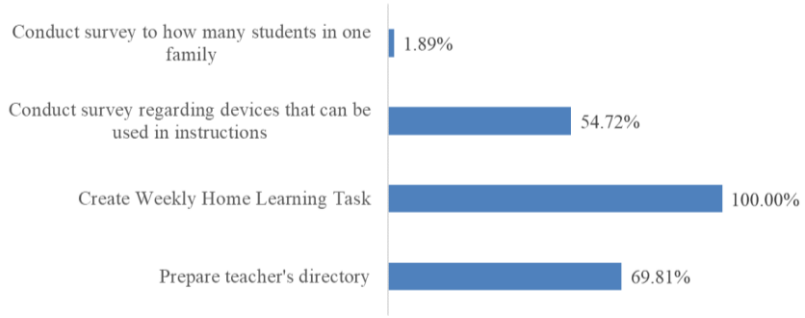


Figure 8. Planned solution of the participants for the Preparation Phase of the MDL-related challenges in Teaching Approaches (*n*=53)

All the participants' plan were to create weekly home learning task to students. The Weekly Home Learning Task (WHLT) indicates all the task necessary to accomplish a student in all subjects with the given schedule. WHLT is mandated in the division where the teachers prepare a timeline of tasks to be given to the parents and students.

More than half of the participants perceived scheduling time blocks for parents and guardians and giving supplemental kit for struggling learners as teaching approaches that can be done to students. This implies that the teachers perceived that this solution would organize the tasks to communicate parents in facilitating the learning of the students at home and their

planned solution to address the challenges met by the participants in helping learners if they faced difficulty in understanding the lesson.

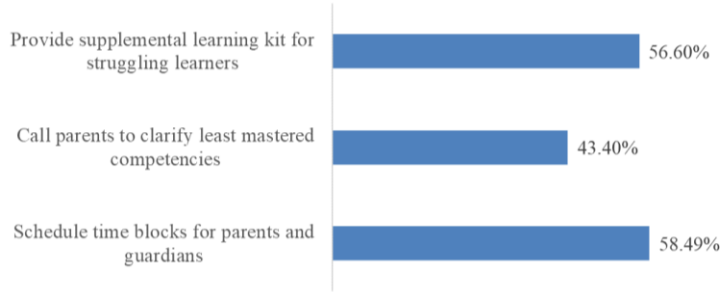


Figure 9. Planned solution of the participants for the Implementation Phase of the MDL-related challenges in Teaching Approaches (*n*=53)

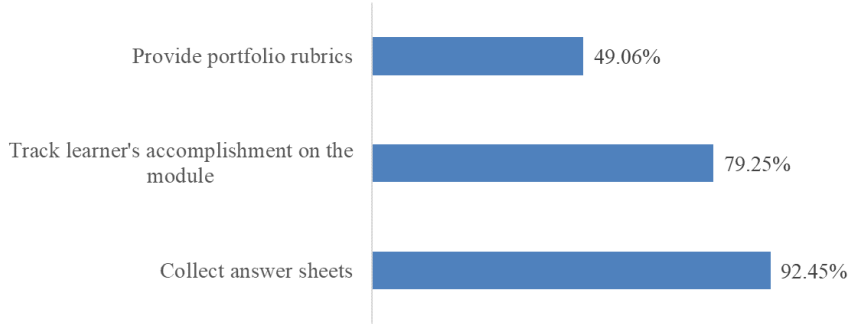


Figure 10. Planned solution of the participants for the Feedbacking Phase of the MDL-related challenges in Teaching Approaches (*n*=53)

Disregarding face-to-face interaction of teachers and students is strongly implemented in the community to minimize problems in the increasing number of cases of the CoViD-19 pandemic. To interact with learners, various teaching approaches, though distance communication, has been applied by the participants considering distance learning to assist learners in their learning needs. Recall that the participants tend to disagree about the ease in monitoring learner's responses and helping learners without parents or household members to guide and support their learning at home, where they consider these as challenges in implementing teaching approaches to learners.

To address the problem in monitoring the responses of the learners (see Figure 3), collecting learner's answer sheets and tracking their accomplishments are the feedbacking plans of the majority of the participants. On the other hand, less than half of the participants planned on providing portfolio rubrics to feedback students. Recalling that the new normal situation disregarded face-to-face contact with the learners to minimize transmission of the disease to a younger age. To get updated with the learners' progress, compiling the students' works and answer sheets would help teachers track if the learner learned the lesson and as well as if the learner needed more reinforcement with the lesson.

Figure 13 shows the planned solution of the participants for the challenges met in terms of assessment. Since learning must continue despite the pandemic crisis and the stress brought about by the community quarantine, learning must continue even though delivering educational instructions is challenging. Assessing students' performance is essential to teaching and learning symbiosis since this determines if the learner is learning the concept. In

the DepEd Order No. 31, s. 2020 stated that as DepEd pursues learning continuity, schools must take standards of assessment and grading practices that will most meaningfully sustenance learner progress and retort to varied frameworks at this time. It can be recalled that the respondents have no problem in terms of assessment (see Figure 4).

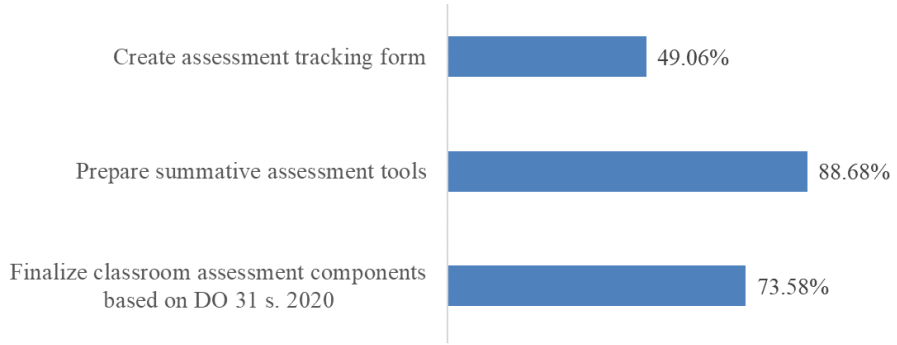


Figure 11. Planned solution of the participants for the MDL-related challenges in Assessment (*n*=53)

The participants consider collecting answer sheets is the best solution to problems relating to feedbacking. Majority of the participants planned also to track learner's accomplishment on the module as to student feedbacking (79.25%). Recalling that the new normal situation disregarded face to face contact with the learners to minimize transmission of the disease to younger age. In order to get updated with the learners' progress, compiling the students' works and answer sheets would help teachers track if the learner learned the lesson and as well as if the learner needed more reinforcement with the lesson.

Majority of the participants planned to prepare summative assessment tools to be given to students to assess their learning aside from the self-learning modules given. Assessing students' performance is essential to teaching and learning symbiosis since this determines if the learner is learning the concept. In the DepEd Order No. 31, s. 2020 stated that as DepEd pursues learning continuity, it is imperative for schools to take stock of assessment and grading practices that will most meaningfully support learner development and respond to varied contexts at this time. This implies that the awareness of the participants of the said memo allowing them to ideate assessment tool such as summative assessment to really assess students if they learned the lesson given.

Conclusions and recommendations

Teacher-participants are not ready in implementing modular distance learning despite the pandemic crisis because of the challenges they faced upon implementation though they are partly prepared due to the relevant trainings they have attended and the consideration of the number of teaching loads to be handled by each teacher. The highest educational attainment of the teachers and the number of relevant trainings attended will relate to the level of challenges in instructional materials implementing modular distance learning. This will be the basis in determining the participants needed in the proposed training design. The profile of the teacher on gender is an adequate evidence associated with the level of challenges in teaching approaches implementing modular distance learning and the number of relevant trainings will correlate the level of challenges in teaching approaches of the participants. Though the teachers perceived that they encountered fewer challenges in implementing modular distance learning modality, particularly in assessing students, but they also consider

that there is still a need to address the ease in providing good feedbacking and locating what competency is least mastered by the students to give appropriate instructional support to students.

Pinpointing the needs included teachers' training is needed to be fully ready in implementing Modular Distance Learning modality in the division. Given that the secondary Mathematics teachers perceived challenges in instructional materials and teaching approaches in implementing modular distance learning modality, capacity training is the solution that the participants demanded.

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