



Multi-Grade Intermediate Mathematics Teaching Schemes: The Case of Education in the District of Tublay, Benguet

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Abstract

Multi-grade is a teaching approach that requires systematic processes to cater to the needs of the learners. The Philippine Department of Education came up with multi-grade teaching schemes to provide teachers with choices to systematically handle the uncommon situation in their classrooms. The study was conducted to determine the knowledge and application of intermediate multi-grade teachers of the different multi-grade teaching schemes in teaching mathematics in the District of Tublay, Benguet. The findings revealed that the scheme choice of the teachers in teaching mathematics is determined by the uncommon objectives and learning competencies of mathematics in different grade levels in a certain grading period. In addition, the claim of the teachers that they are using locally modified scheme, Benguet Scheme D, in teaching intermediate mathematics is mainly backed by the fact that teachers are developing uncommon learning competencies for the combined grade level. However, varied deviations in the implementation processes of the scheme used by the multi-grade teachers in teaching intermediate mathematics were observed even when the same scheme elements were used since they claim to use Benguet Scheme D. The effectiveness of the schemes was tied by the teachers to time efficiency and level appropriate activities.

Introduction

Amongst the many endeavors of the Education For All (EFA) is the multi-grade education. Specifically, multi-grade education is reaffirmed as a tool to attain the 2015 EFA goals. A multi-grade class combines at least two different grade levels in the

same classroom at the same time. The combination is usually of successive grade levels, such as Grades III and IV or Grades V and VI. This teaching learning structure traces back its history in the United States in the 1800s. Miller (1991) has pointed out that the multi-grade classroom became a driving force during the 1970s as a movement for open education, which

continued to this day in many rural schools.

The multi-grade approach is recognized by the Philippines as a vital tool in adhering to the demand that the state must give access to quality education to its people especially from those in the far flung and less populated areas. In line with this, DECS Order No. 96, S. 1997 defined multi-grade as a class of two or more grades under one teacher in a complete or incomplete elementary school. Moreover, the multi-grade classroom may have a minimum of eight pupils and a maximum of 35 pupils. The order mentioned that a multi-grade teacher must be provided with a Minimum Multi-Grade Instructional Package (MIP).

According to Taole (2011), multi-grade classes are most common in rural schools where there are not enough learners to justify separate classes. Little (2006) and Mathot (2001) also noted that other factors causing a single or two teachers to become responsible for teaching students at different levels can be attributed to widely scattered schools due to low enrolment rate and the shortage of teachers and classrooms.

Multi-grade classroom set-up was incorporated in the Philippine educational system with the belief that it can raise the literacy and achievement rate in the rural areas. Villalino (2010) revealed that 12,225 or 32% out of 37,697 public elementary schools were multi-grade in nature in the school year 2008-2009. Furthermore, Villalino (2010) also pointed out that 8 % or 866, 296 of the 12, 574, 506 total enrolment attended multi-grade schools. As such, Southeast Asian Ministers of Education Organization (SEAMEO INNOTECH, 2012) said that the advent of issues and challenges occurred such as the implementation's lacking in monitoring and quality evaluation due to low priority in funding and resource allocation. All of these have emerged as a consequence of rapid growth of multi-grade classes in the country.

The Department of Education (DepEd) under its new institute continues to recognize the role of multi-grade teaching in fulfilling the aim of the state to promote access to quality education to all learners. Due to the inevitability of giving instruction to basic education learners regardless of their number and distance from mainstream classes, improving the existing guidelines on multi-grade is important. Hence, DepEd Order (DO) No. 81, S. 2009 was implemented with the aim of strengthening the implementation of the multi-grade program in the

Philippines.

However, even if multi-grade situations exist in a number of countries, during the pre-service and in-service teaching course, Mathot (2001) observed that the teachers are not provided with enough skills required to manage and teach multi-grade classes. Veenman (1995) also pointed out that teachers of multi-grade classes are poorly prepared in teaching two or more grades at one time since their approaches are reflective of methods more suited for single-grade context. Contrastingly, he noted that the outcomes of multi-grade classes are more positive compared to those in the single-grade setting where these issues of teacher competence are addressed.

In response to such situation, DO 30, S. 2014 set guidelines for the utilization of financial resources as support in strengthening the implementation of the Multi-Grade Program in Philippine Education (MPPE). The MPPE plays a significant role in improving the quality of educational services and learning outcomes of learners specifically in remote and underserved rural communities of the country. It has been proven that multi-grade classes when given appropriate interventions, and their teachers provided with materials and appropriate training on effective teaching approaches, can perform in accordance to standards (DepEd, 2014).

At the grassroots level, a vast number of schools in Benguet have multi-grade classes which gives a great sense in the idea of giving attention to what is going on inside these classrooms (Table 1). Commonly, incomplete grade level schools in the provinces having multi-grade classes are situated in the outskirts of Benguet causing the low enrolment rates, which further affects the allocation of additional classrooms and teachers. However, the situation is not limited to this since even schools with complete grade levels have tendencies of resorting to the use of the multi-grade approach due to fluctuating and sudden changes in enrolment population. Enrolment fluctuations are often results of transferring out of learners, dropping out, and repetition of pupils. In the case of mathematics, instruction is not spared in the current phenomena brought by the multi-grade system.

All educational systems around the globe see mathematics as an integral part of their curriculum. Tadaoan (1997) claims that mathematics is the "queen of knowledge" and is the most important fact about



Table 1

Number of Schools with Multi-Grade Classes in the Division of Benguet for the School Year 2017-2018

District	School Type		Total Number of Schools with Multi-grade Classes
	Complete Grade Levels	Incomplete Grade Levels	
Atok	6	6	12
Bakun	12	9	21
Bokod	21	12	33
Buguias	14	7	21
Itogon I	3	2	5
Itogon II	4	3	7
Kabayan	8	4	12
Kapangan	11	8	19
Kibungan	6	10	16
La Trinidad	5	0	5
Mankayan	6	12	18
Sablan	7	2	9
Tuba	13	3	16
Tublay	11	2	13
Grand Total	127	80	207

the real and material world. In support, Balino (2008) stressed that mathematics plays a vital role in the curriculum; however, learners may see mathematics negatively when preparatory background is lacking. The multi-grade learners are not exempted from this idea.

SEAMEO INNOTECH (2012) compared the Philippine National Achievement Test mean percentage score of the mono-grade and the multi-grade schools in the curriculum year 2008-2009. The results showed that the multi-grade schools showed lower performance in all the subject areas. Moreover, mathematics exhibited the largest margin of difference between regular mono-grade schools and the multi-grade schools. Specifically, the mean percentage score of the multi-grade schools is 57.88% which is 10.82% lower as compared to 68.7% of the regular mono-grade schools (SEAMEO INNOTECH, 2012). These results contradict the aforementioned studies applauding the better performance in a multi-grade classroom than in a regular classroom.

This situation would further imply a need to understand the situations in the Philippine multi-grade classrooms especially in teaching and learning mathematics.

Mathematics is one subject that permeates life at any age and in any context. Thus, its value goes beyond the classroom and the school. The context is defined as a locale, situation, or set of conditions of Filipino learners that may influence their study and use of mathematics to develop critical thinking and problem solving skills (Figure 1).

The twin goals of mathematics in the K to 12 basic education levels are critical thinking and problem solving. Scriven and Paul (1987) defined critical thinking as the logically disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and or evaluating information that is gathered from, or generated by observation, experience, reflection, reasoning, or communication, as a guide to belief and action.



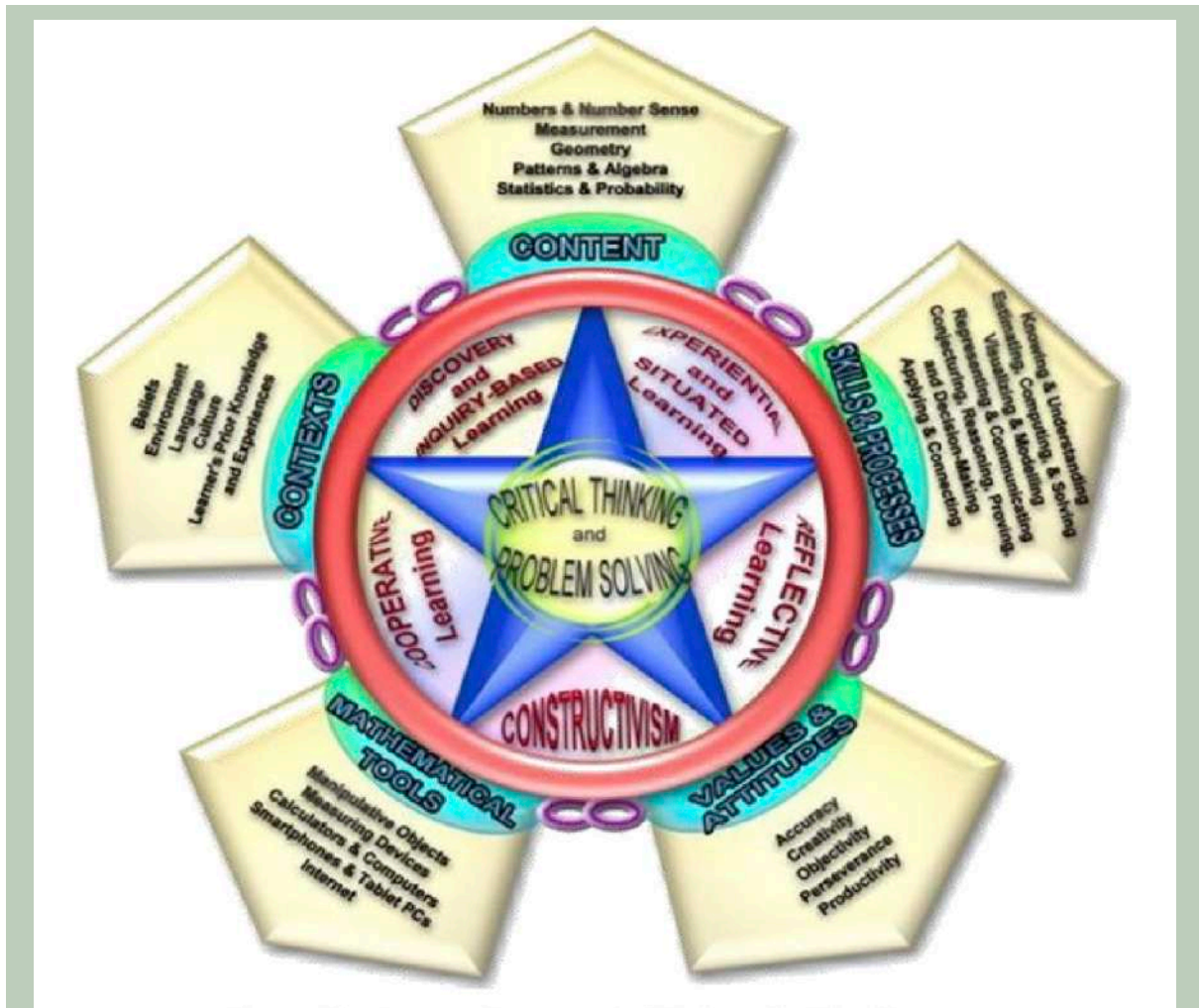


Figure 1. Conceptual framework of the K to 12 mathematics curriculum (DepEd, 2016)

Meanwhile, mathematical problem solving according to Polya (1962), is discovering a way around a difficulty and finding a solution to a problem that is unknown. It is implied therefore that should critical thinking and mathematical problem solving skills be achieved, there is a need for organized and rigorous curriculum content, a well-defined set of high-level skills and processes, desirable values and attitudes, appropriate tools, and consideration of the different contexts of learners.

In the quest of the country to improve learning in the multi-grade classrooms where mathematics is a major subject, multi-grade teachers are provided with options for teaching in the classroom as stipulated in the Enclosure Number 3 to the DECS Order No. 96, S.

1997. Through this, the difficulties caused by teaching two or more grades at the same time should not cause decline in the performance of pupils. In fact, Chace (1961) found that multi-grade students performed consistently higher in mathematics, reading, and language than mono-grade students. It is imperative therefore that educators know and apply necessary and appropriate practices, strategies, methods, and schemes to maximize the potentials offered by multi-grade teaching in providing quality and competitive education to children.

Enclosure Number 3 to the DECS Order No. 96, S. 1997 suggested options for teachers to manage learning inside a multi-grade classroom. Since teachers cannot depend on rote methods, a teacher



may choose from the varied delivery methods indicated in the enclosure depending on the nature of the subject, the teacher, and the class personality. The multi-grade teaching schemes is among the mandated management strategy which teachers may choose from in handling their classes.

Schemes are described as a concise and systematic outline or table. In its application in the classroom, Galarosa (2015) defined multi-grade teaching scheme as a way of a teaching used inside the classroom that is based on the objective or skill that needs to be developed. The schemes will also suggest the lesson plan format. Though the use of the teaching schemes is based on the skills and competencies to be taught, the teachers are allowed to be flexible in adjusting the arrangement of the required learning competencies.

The DepEd provided multi-grade teachers with five teaching schemes that were identified as Schemes A, B, C, D, and E. Each scheme has distinct characteristics that would answer to the different situations in teaching different competencies. Also, these multi-grade teaching schemes may be used in any subject area so long as the scheme will answer to the need of the subject.

However, the Schools Division of Benguet modified Schemes A and D so that the schemes will be more appropriate to the present multi-grade situation in the Division of Benguet. These schemes were attuned based on the suggestion of Tican (2016) noting that since DepEd districts serve as a pilot district for the implementation of some programs of the multi-grade. Though there are no huge changes from the national schemes, the adjusted format will hopefully make it easier for teachers to understand. The revision, however, made sure that the important features of the schemes will not be distorted. The only aim of the adjustments is to relate the schemes to the generally recognized characteristics of the multi-grades in the division. Basically, the modifications were done to set the schemes in the common two-grade level combination classes in Benguet.

For consistency of usage and coverage of the analysis, the study focused on the modified schemes by the DepEd Division of Benguet. Thus, Benguet Scheme A and Benguet Scheme D.

From the given situations, this study determined the knowledge and application of intermediate multi-grade teachers of the different multi-grade teaching

schemes in mathematics. Specifically, this study found out the teaching schemes used by the teacher in teaching mathematics in multi-grade classes. Moreover, this study observed and described the implementation processes when using the chosen scheme in teaching mathematics in the multi-grade class. Finally, understanding the factors associated with the effectiveness of multi-grade teaching scheme used in teaching mathematics was documented. Also, as an input to multi-grade education, the study operationalizes a framework adaptable in teaching mathematics.

Methodology

This research made use of qualitative design approached through a case study. The nature of the problem led to the need for a holistic approach that involved discovery. The qualitative data came from intensive individual interviews and classroom observations. Furthermore, the study used complete enumeration as all the multi-grade school with intermediate multi-grade teachers in Tublay were involved in the research. Specifically, the respondents were composed of six schools with Ibaloy learners and teachers and one school with Kankanaey learners and a teacher having intermediate multi-grade classes located in the outskirts and less populated communities in the municipality of Tublay. The District of Tublay is at the average when comparing the number of multi-grade schools in each district in the Division of Benguet as seen in the aforementioned 2017-2018 statistics of multi-grade schools in Benguet (Table 1, p. 117).

Classroom observation was crucial to verify the claims of the teachers about the schemes they implement in teaching mathematics in their multi-grade classrooms. As such, actual classroom observation was conducted after proper communication with school heads and the teacher concerned. The names of the participants were anonymized to protect their identities (Table 2).

The research used descriptive and narrative approach to present data with the aid of figures/diagrams. Answers, comments, and other relevant information were properly documented and were treated as part of the responses that were subjected to analysis.

All data were interpreted and analyzed based



Table 2

Details of the classroom observation

Teacher Participant	Observation Date	Classes Combined	Scheme
Teacher Kris	February 21, 2017	Grade 5 and 6	D
Teacher Beng	February 20, 2017	Grade 4 and 5	D
Teacher Jean	February 24, 2017	Grade 5 and 6	D
Teacher Joy	February 27, 2017	Grade 4 and 5	D
Teacher Ely	February 27, 2017	Grade 5 and 6	D
Teacher Len	March 6, 2017	Grade 5 and 6	D
Teacher Rose	February 20, 2017	Grade 5 and 6	D

on the classroom observations and the responses of the respondents during the personal interview. Answers were recorded with the approval of the participants. Since the study used Benguet Schemes, the classification of observations and responses of the respondents were according to Benguet schemes. The Benguet Schemes are results of the modification of Multi-Grade Teaching Schemes downloaded from the national level. These schemes are classified as Benguet Scheme A and Benguet Scheme D.

Results and Discussion

Math Teaching Schemes Employed by the Teachers in Multi-grade Classes

The teachers teaching multi-grade mathematics identified Benguet Scheme D and Benguet Scheme A as the schemes that they have been using in teaching mathematics. These two schemes suggest contrasting processes in handling a multi-grade class. These schemes are total opposites especially in terms of the teacher's delivery of the lesson and time allotment for each of the combined classes. Teacher Kris verified this claim in her statement: "*Wara eray Benguet Scheme A, B, C, D tan E jen mabedin usalen depende nudta topic. Shi panagturo ni mathematics, mabedin tayo jen usalen e D or A* (There are schemes A, B, C, D, and E that could be used depending on the topic. In teaching mathematics, we could use D or A)."

The teachers involved in the study also claimed

that Benguet Schemes A and D are suitable to the conditions presented by the structure of mathematics where objectives and competencies in the curriculum are written in a more specific manner, which helps teachers to easily draw the line of commonality and differences between the objectives and competencies. These factors are very important in choosing the schemes to be used. This situation also reinforces the claim of the teachers that the main factor in the choice of schemes is the objectives. Teacher Jean expressed that, "The objective for each grade is the number one factor that is considered in choosing the scheme."

Benguet Scheme A. Benguet Scheme A is applicable when the competencies of both grades are indexing or the same (Table 3). This scheme is closely the same as the National Scheme A except that it is presented in a manner that will cater to a two-grade combined class. The teacher will handle the combined classes as a mono-grade. This would mean that both grades will undergo the same teaching-learning process at the same time. However, to recognize the difference in the cognitive maturity of the learners, the teacher must give differentiated activities to the learners most especially during the application and evaluation part of the lesson.

Benguet Scheme A suggests treating the combined grades as a mono-grade class. Figure 2 shows the sequence of activities when using Benguet Scheme A where the teacher simultaneously handles the combined grade levels. The figure further shows that when a teacher uses Benguet Scheme A in a multi-grade class, there would be no shifting or transferring from one grade to the other.



Table 3

Lesson Plan for Benguet Scheme A

Grade V	Grade VI
I. Objective/s (same object for both grades) - competency indexing	
II. Content and Materials: Grade V _____	Grade VI _____
III. Developmental Lesson A. Preparatory Activities: 1. Review 2. Motivation B. Presentation C. Generalization D. Guided Practice/s (application) Use of Direct Instructions and Explicit Instructions Guided Practice I (simpler or easier for lower grade) Guided Practice 2 in so on	
IV. Evaluation: (Combination of simpler and complex questions or tasks)	
V. Assignment or Agreement	

It is important to note that the use of this scheme will only be possible when the target objectives for each grade level are common in terms of behavior and content. However, with the spiral nature of the K to 12 mathematics in the country, it is unusual for two grade levels to have a common objective or competency in the same timeline. To deal with this, teachers are given the option of indexing. Indexing is the process by which the mathematics competencies in the combined grade levels may be rearranged by the teachers to align the common competencies in the same timeline. Moreover, it is also essential to be reminded that the combined grade levels still differ in level of learning; thus, the grades must still differ in the level of difficulty of activities especially in the application and evaluation part of the lesson.

According to Teacher Kris: “*Say mausal tayo e Benguet Scheme A, inkuwan ni division office jen i-align era sota competencies jen nan-enges or correlated angken nu hayay eran competencies ket naypalaw shi nan-inafel jen quarter* (So we could use Benguet Scheme A, the division office suggested that we align the competencies that are the same or correlated even if these competencies are assigned for different quarter).”

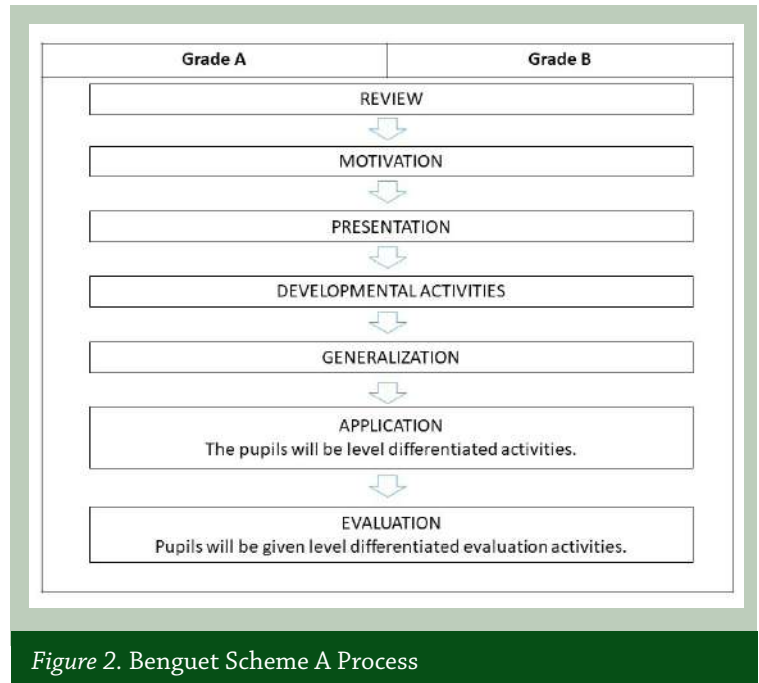


Figure 2. Benguet Scheme A Process

Benguet Scheme D. Even though using Benguet Scheme A would allow teachers to handle a multi-grade class like a single class, the interviews revealed that the respondents preferred using Benguet Scheme D. Benguet Scheme D is used when the competencies of the classes do not have any commonality (Table 4). Teacher Jean expressed that, “The objectives for each grade is the number one factor that is considered in choosing the scheme.”

Since the competencies for each grade level are not common, the teacher must separately develop the lesson for both the classes. To make this happen, the attention of the teacher must be focused first on one of the grades while the other class is having an unsupervised activity. Benguet Scheme D is also characterized by the proper use of its elements which includes waiting time, shifting, with teacher activity, and without teacher activity (Table 4).

Benguet Scheme D turned out to be the most commonly used scheme since it is most suited for the nature of mathematics. According to the teachers, the uncommon learning objectives in the intermediate level mathematics for each quarter and the clear difference between the competencies is very evident. Such situation is caused by the organized and rigorous curriculum content, and well defined set of skills and processes in mathematics as presented in the conceptual framework of the K to 12 mathematics curriculum (Figure 1, p. 118).



Table 4

Lesson plan for Benguet Scheme D

Group I or Grade III	Group II or Grade IV
II. Subject Matter	II. Subject Matter
III. A. Preparatory Activities (waiting time activity) Review Motivation	III. Giving brief instruction for the seatwork A. Seat Work in linking previous lesson with current topic/lesson
III. Presentation C. Generalization D. Application/Guided Practice Direct Instructions (teacher shifts) (self-checking with the use of score charts)	III. Presentation C. Generalization D. Application/Guided Practice Direct Instructions
IV. Evaluation (with the help of pupil-teacher/ leader)	IV. Evaluation (Teacher can mill around – checks the work of the Grade III while Grade IV are having their evaluation)
V. Assignment/Agreement	V. Assignment

When using Benguet Scheme D, the teachers would not need to rearrange the competencies of any of the grade levels that they are going to combine. This would also imply then that the teachers will develop different objectives for each of the combined classes. Benguet Scheme D provides the educators with a system to develop separate objectives for the classes which would allow the teacher to teach the combined classes separately.

Since all of the teacher respondents prefer following the prescribed arrangement of the competencies resulting to the use of Benguet Scheme D, the teachers are compelled to conduct separate and different teaching-learning processes for the combined grades. Due to the nature of the scheme, the teacher must appropriately and efficiently balance the use of the elements that define Benguet Scheme D. Furthermore, the 50-minute time allotment for K to 12 mathematics must be equally split among the combined grades. For Benguet Scheme D to be implemented properly, four main elements must be used efficiently. These elements: are waiting time; with teacher or supervised activity; without teacher or independent unsupervised activity; and shifting.

Figure 3 presents Benguet Scheme D. The orange

rectangular figures represent ‘without teacher or independent unsupervised activities’. These without-teacher parts of the scheme are further classified into ‘waiting time’ and ‘independent unsupervised activity’. The blue rectangles are ‘with teacher or supervised activities’. Furthermore, the blue downward arrows show continuous ‘teacher-supervised activities’. Finally, the green arrows that cross the boundary line between the two grades show ‘shifting’ or the transfer of the teacher.

Waiting time. A multi-grade teacher when using the Benguet Scheme D most often cannot give direct attention to the other class. During the start of a lesson, often, instructions and materials are given to one of the classes for their unsupervised activity while the other waits and are left idle. This situation where pupils are idle is called waiting time. The waiting time of the learners often takes a very short period of time. Commonly, this is the initial part of Benguet Scheme D for the class that will be first supervised by the teacher. This waiting time of the learners may pose some complications and problems if delays arise in the course of the giving of instructions to the other class that will take on the independent unsupervised activity. Thus, it is imperative that giving of instructions to the other class be brief and clear as



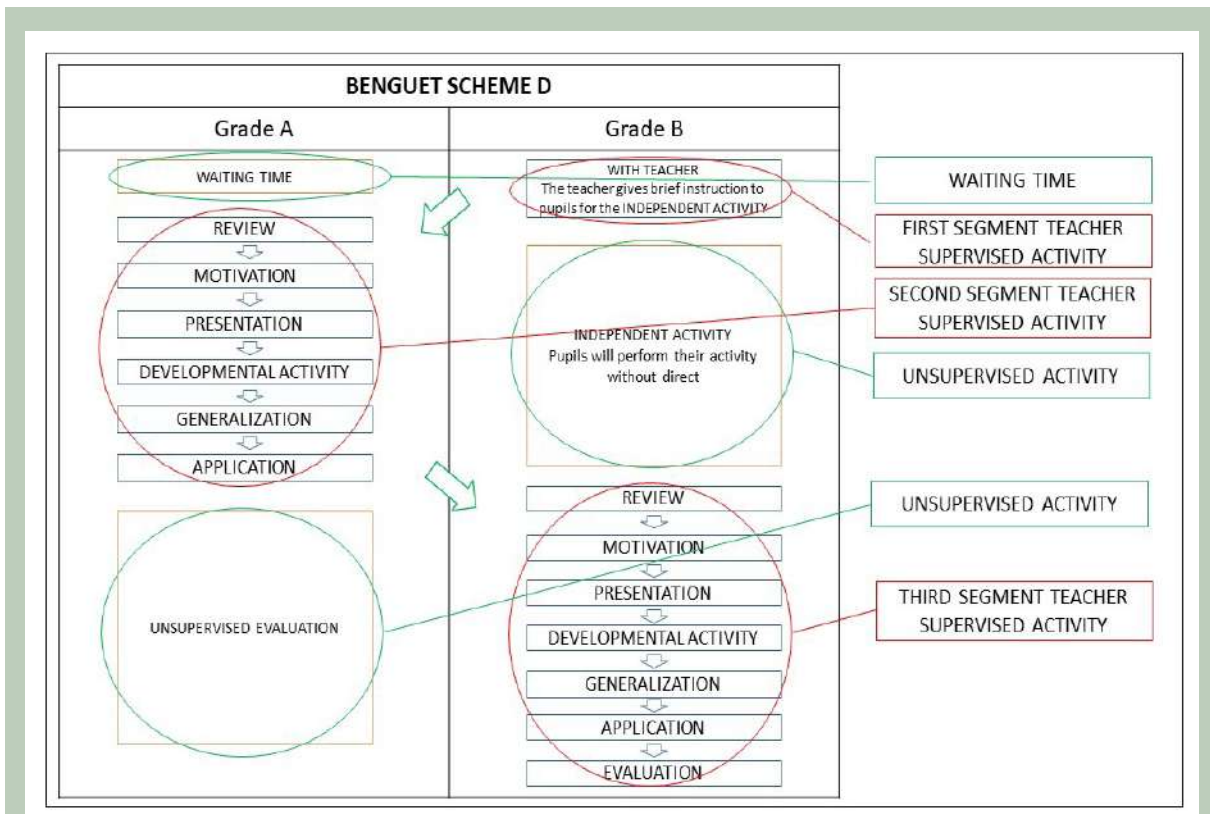


Figure 3. Benguet Scheme D Process

possible. Sowell (2017) shared the same thought in his findings where he stated that good instruction-giving is an essential part of effective lesson and an important part of classroom management.

With teacher or teacher-supervised activity.

Teacher-supervised activity is defined as the situation when using Benguet Scheme D where the teacher directly interacts and discusses with the pupils. The presence of the teacher as a facilitator of learning during the teaching-learning process makes the attainment of the objectives more possible. Baker (2010) supported the idea in his findings where he mentioned that the teacher immediacy and presence is a statistically significant predictor of student affective learning, cognition, and motivation.

When using Benguet Scheme D, the teacher is not given the whole period allotted for mathematics to directly supervise both of the combined grade levels. The attention of the teacher must shift from one grade to the other to develop the separate objectives for each of the combined grade levels. Given only half of the usual time for the teacher to directly attend

to each of the grade levels, the DepEd designed the scheme to have a continuous and undisrupted flow. The teacher will focus his attention on Grade A from review until giving of evaluation work while Grade B pupils are having an independent unsupervised activity. As the Grade A pupils perform their evaluation work, the teacher transfers to Grade B to develop the lesson until the evaluation. Due to this situation, a teacher must maximize the 25 minutes for one grade level, which may result to uncompleted process.

This was seen in the case of Teacher Beng who was not able to generalize the lesson. She even emphasized that other subjects may be sacrificed due to time shortage. Teacher Beng said that:

Nu pinsak mesepol maysacrifice e eshum subjects nu iparas jen kekshengen e lesson. Angken nu naysulat shi lesson plan enshi kabalanan to ket ekalen e application nu dta lesson a. Kuwan met nen school head jen e importante mangeneralize ni lesson (Sometimes we will have to sacrifice



other subjects if we try to finish the lesson. Even if we wrote it in the lesson plan we have no choice but to remove the application part of the lesson. Our school head told us that what's important is we generalize the lesson).

Without teacher or independent unsupervised activity. Both waiting time and independent unsupervised activity are not directly supervised by the teacher. However, unlike for waiting time, the pupils are doing on a given activity when they are under independent unsupervised activity. While the teacher facilitates learning on Grade A, the Grade B pupils work on their independent unsupervised activity. Commonly, the without-teacher activity are in the forms of seat works or group works. This could be beneficial to the teacher but it may also present some problems if its potentials are not utilized. Thus, the initial instructions and class routine and rules are very important to have a successful independent unsupervised activity especially that, if possible, the pupils are not supposed to disturb the other class by asking questions regarding the activity. Adams (2016) reiterated that by making students alert to classroom rules and routines and other aspects of classroom management, teachers can maintain the appropriate environment for effective instruction including outputs.

Shifting. The continuity of the teaching-learning process is a factor that will determine the success of using Benguet Scheme D. Though Benguet Scheme D does not allow the merging of the developmental activities of the combined grades, it suggests the appropriate and properly timed shifting of the facilitator. Shifting is the transfer of the teacher supervision from one grade to another. Benguet Scheme D only utilizes utmost three shifts to complete one successful implementation. The limited number of shifting will minimize disruptions and wastage of time. Excessive shifting may interrupt the learning process and may lead to confusion among learners and would require extended time frame for the subject. Moreover, too much shifting would connote an unorganized set of activities and inadvertent Benguet Scheme D. Thus, shifting will determine if the implementation of the scheme is according to what is suggested.

Implementation Processes of Benguet Scheme D in the Intermediate Mathematics in the Multi-Grade Class

Although Benguet Scheme D was unanimously identified by the respondents as the most commonly used scheme in teaching mathematics in the multi-grade classes, the implementation process employed by teachers varied from one respondent to the other. Though all of the teachers developed separate teaching-learning processes for each of the combined grade levels, the teachers must also take note that the appropriate use of Benguet Scheme D gyrates around the efficient utilization of waiting time, independent unsupervised activity, teacher-supervised activity and shifting. However, as per observation, most of the processes used inside the classroom deviated from the processes expected when using Benguet Scheme D.

Some claimed that they revise the schemes to make the teaching-learning process more productive. While others, cited time as a big factor that may affect the implementation of the processes of the scheme especially in mathematics that would commonly require longer time in solving problems.

Teacher Beng cited that: "*Mangeneralize ak kuma nga talaga. Wara pay shi lesson plan ko. Dinebkan ko ta nak pansangbota e oras. Angken eg met mangyare iyay ni ulay, wara ladta ah* (I was really supposed to generalize the lesson. It was in my lesson plan. I forgot it because I was hurrying to catch up with the time. Though this does not happen all the time, it still happens)."

On the other hand, some teachers blamed the deviation from the suggested Benguet Scheme D implementation to uncontrollable circumstances and occurrence of some events. Teacher Rose also mentioned a non-academic but relevant reason for the non-participation of her pupils that resulted to the distorted implementation of the scheme: "*Wara e kasal nunta davi. Eg met ketdi mepasamak jen ulay iyay; naytutumpong bengat. Nem sakey met ketdi iyay jen problema ni Benguet Scheme D* (There was a wedding program last night. This does not usually happen; it was just a coincidence. But this is actually one of the problems of Benguet Scheme D)."

These conditions and causes brought about some deviations in the implementation processes of Benguet Scheme D. To further explain, this study would use the elements of the scheme to present the



deviations incurred during the teaching-learning process. These elements are waiting time, without teacher or independent unsupervised activity, shifting, and with teacher or teacher-supervised activity. However, to be more specific, the study segmented the teacher-supervised activity into three segments.

Figure 4 compares all the implementation processes employed by the teachers to the prescribed Benguet Scheme D. Furthermore, this figure summarizes the deviations in the process implementation of the teachers. The orange boxes represent the without-teacher activities, which are the waiting time and the independent unsupervised activity. The blue rectangles are teacher-supervised activities. Moreover, the blue arrows show an uninterrupted flow of teacher-supervised activities. Finally, the green arrows signify the shifting of the teacher from one grade to another.

Waiting time. Idle moments for one of the combined grade levels will definitely occur when following the prescribed Benguet Scheme D. This waiting time would occur in the initial stages of the scheme while the teacher is giving instructions for the independent unsupervised activity of the other grade. Ideally, upon staying idle for a short moment, the class who waited will be attended by the teacher to start the lesson as the other perform the activity assigned to them. However, instead of starting the process with a waiting time, four out of seven teachers conducted a joint motivation activity for both of the class before allowing a waiting time. Accordingly, this would set a better mood for the whole class to allow better participation from the learners.

Though waiting time for learners is expected only at the beginning of the class, this situation may also occur in the developmental activities especially when teachers were not able to align mathematics activities to the ability of the learners during the independent unsupervised activity. To be specific, when learners are supposed to finish an independent mathematics activity for 15 minutes but they are able to finish it for 10 minutes, then it would result to waiting time for them since the teacher is still teaching in the other grade. Such event was seen in some of the observed classes. For instance, in the class of Teacher Beng, one of the groups began telling stories after they finished their unsupervised activity earlier than expected, which further affected other groups and their participation when the teacher shifted to

their grade level for the supervised lesson. This would prove the thought that many idle moments in the classroom would result to boredom and uninterested learners, which could be attributed to the teachers teaching style. Wright (2011) blamed the teaching styles of teachers and unengaging instruction for the unmotivated and bored learners; thus, what happens in the classroom depends on the teachers' ability to maintain learners' interest.

Without teacher or independent unsupervised activity. During an independent unsupervised activity, the learners are going to work without the direct supervision of the teacher. In the K to 12 mathematics, one period in a day is allotted 50 minutes. This would mean that each grade in the multi-grade class is given half of that time to learn what ever competency they are going to learn. As a result, learners are given even lesser time in doing an independent unsupervised activity, which would imply that the time in doing so must be maximized. To do this, a teacher must be able to motivate learners to exert their effort in working while the teacher handles the other grade.

As per observation, all the respondents stated that their verbal instructions for the independent unsupervised activity with hard copies containing more elaborated instructions. Riet (2012) said that teachers have a wide range of learning teaching support materials, which include workbooks, charts, and other related materials. Included in the findings is that the use of these materials is contributory to learning of learners. In the case of the study, the respondents utilized activity instruction cards, worksheets, and manila papers posted on the board.

Even after giving learners instructions with supplementary hard copies, the teachers admitted that the unsupervised independent unsupervised activity of the learner poses a lot of disturbances and undesirable occurrences. Some of the identified situations are bullying, neglect of task, and doing irrelevant and disturbing things. An example of this happened in the class of Teacher Rose where three boys chose to sleep instead of doing their task. Since the teacher was discussing in the other grade, it was late when she discovered the actions of the learners. Even worse, the attitude of the learner continued during the supervised activity by ignoring the instructions of the teacher since the pupil cannot present any output from the independent unsupervised activity. In the case of Teacher Beng, one of the learners created a



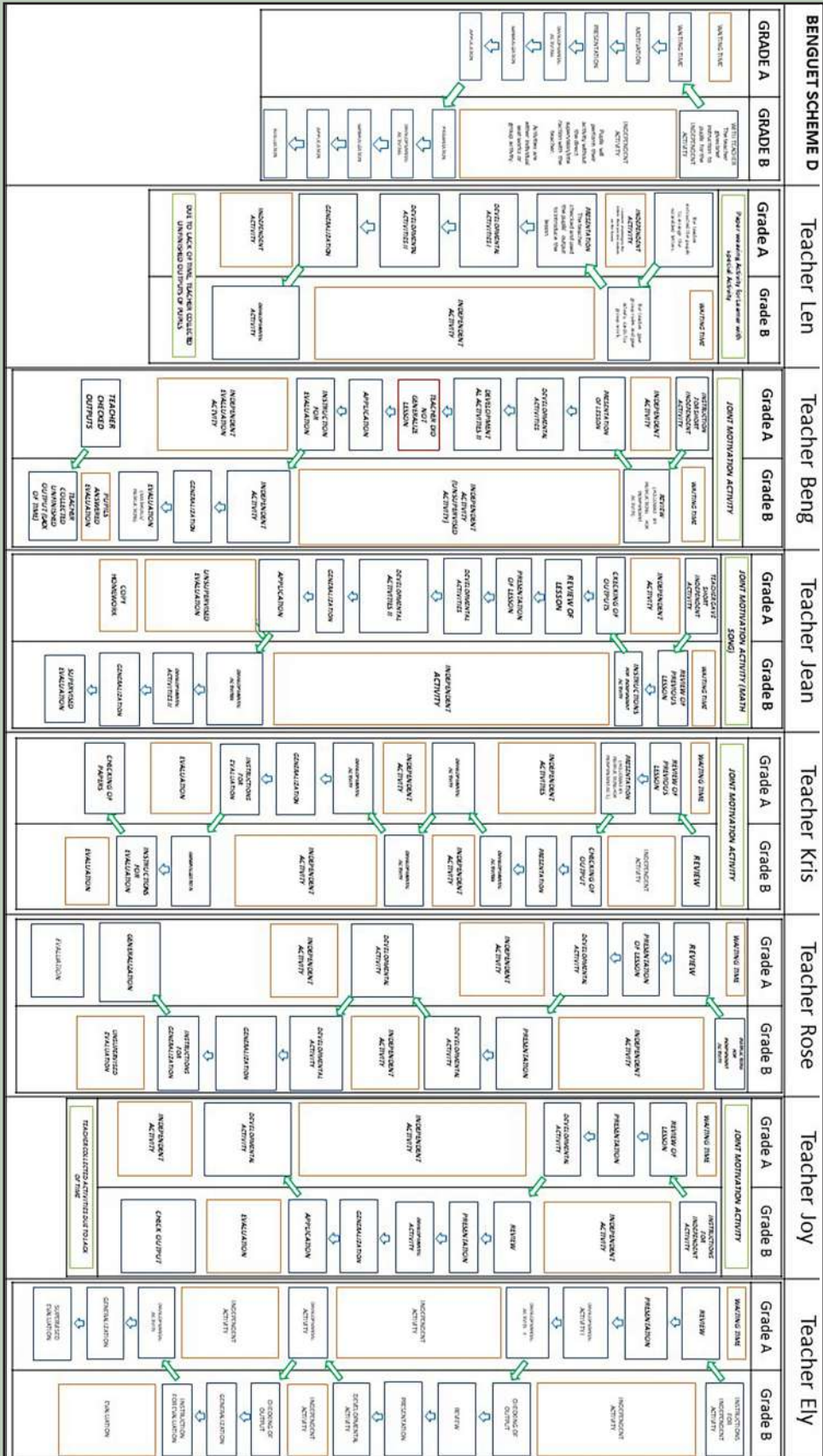


Figure 4. Teacher-respondents' deviation in using Benguet Scheme D when teaching mathematics in the multi-grade classes



ruckus among the groups having a group work.

In response to these kinds of situations, the teachers presented ways of dealing with them. Two teachers used scoreboards to remind the learners of their responsibilities when they are not supervised. Another teacher said that getting the attention of the learners with cues, nonverbal communication, and the use of proximity is a way to maintain order in the class. On top of all the strategies is the use of routine. Most of the teachers relied on the use of established routine.

One remarkable routine was seen in the class of Teacher Jean. All the teacher had to do was to give the main activity instruction card to representatives then all that followed was a smooth and continuous completion of independent task. What further proved the routine's firm establishment was the fact that the learners completed two sets of unsupervised activities without any cue from the teacher. An interesting point she brought out that completed their routine is the presence of an inside comfort room. Nwiyii (2017) supported this thought when he pointed out that facilities were also noted as factors that affect classroom management, because no matter how qualified a teacher may be, he or she still needs a conducive classroom with all the features of a good classroom to enhance teaching and learning.

While the respondents claim that the unsupervised or independent unsupervised activity pose some possible problems, they also said that it can develop learners' responsibility for learning when learners are well oriented about the importance of such activity. Teacher Beng explained that:

Importante e independent unsupervised activity angken edigat ja mayshuki tep dagen ni aanak e ubda sha jen ayshe e maestra. Ininot, ashalen sha e banol ni mancreate ni sahey bado tan creative ja banag from simple jen instructions. Mayat e dekna ni maestra nu asen to jen mayat e dengka ni eskweda. At least ket maikuwan ja war ngo naachieve (Independent unsupervised activity is important even if it is hard to establish at first because the pupils will do their work without the teacher. Slowly, they will learn the importance of creating something new and creative from simple instructions. The teacher will

feel good if she sees that the outputs of the pupils are good. At least we can say we achieved something).

With teacher or teacher-supervised activity.

When supervising the learning process of the learners in a multi-grade, the teacher will need to maximize half of the time allotted for mathematics to complete the whole process of teaching from motivation until application (Figure 5). Maximizing half of the time allotment is essential since the teacher must implement the same process to both of the combined grades.

Accordingly, in the suggested Benguet Scheme D, the teacher is expected to conduct three teacher-supervised activity segments in one session to complete a teaching-learning process of a multi-grade mathematics. These activities will allow the teacher to develop the lesson aided with his presence to guide the learners and prepare them for their independent activities. The first segment of the teacher-supervised activity happens at the start of the scheme where the teacher gives instructions and activity guidelines together with the materials to one of the classes for their independent unsupervised activity.

After this, the second will follow where the teacher shifts to the other class to complete a teaching learning process and introduce and develop a competency, which would include the processes like that of a mono-grade class. Finally, in the third segment, the teacher will transfer back to the class that has had its independent unsupervised activity to supervise the pupils in learning a competency from presentation to application.

In essence, the second segment comprises of the review of the previous lesson related to the new lesson, a motivation activity, presentation, developmental activities, generalization, and application. This is totally the same with the processes in a mono-grade class except that it needs to be done within half of the time allotment for mathematics. The third segment is the same with the second segment only that it is performed on the other grade.

Teacher-supervised activity in first segment.

The preliminary segment of the teacher-supervised activity is expected to come through giving of instructions to the class that will work without the direct guidance from the teacher. However, four out of the seven teachers started by supervising both



of the combined grades through leading the pupils with either a drill or a song that will motivate the combined class together. The teachers claimed that the supervised motivation activity carried to both the combined grades at the same time will lessen time consumption. After that, three among the four teachers who gave simultaneous motivation activity proceeded with giving instructions to the group that will have their independent or unsupervised activity. The other teacher instructed one of the combined grades to check their home works using the posted key answers then shifted to the other group to give an independent unsupervised activity.

On the other hand, two among the seven teachers started by giving instructions to one of the classes while the other waits. Doing such will prepare the class that will have an unsupervised activity. This is in accordance with the suggested format of the preliminary teacher-supervised activity under Benguet Scheme D, which means the teachers followed the first steps of the prescribed Benguet Scheme D.

Though it is very evident that most of the teachers

are trying to supervise at least one of the combined grades during the first segment of the teacher-supervised activities, it is noteworthy to mention that one teacher was not able to give immediate supervision to any of the combined grades. Specifically, the teacher needed to attend to the needs of two learners with special needs while the other pupils are left idle and are waiting for directions from the teacher. This particular situation cannot be addressed by the structure of Benguet Scheme D. Moreover, the dilemma of the teacher in the situation forced her to choose to give a paper weaving activity to the learners with academic challenges to at least avoid them from intervening and disturbing the other learners. The teacher proceeded to giving of a presentation activity to one of the grades then shifted to the other to give guidelines for the independent unsupervised activity of the pupils. To further elaborate the situation, Teacher Len said that:

Narigat et ya ay man-ubla ya man-adal sin multi-grade conditions karkaru mu wada di skwela ay mankasapulan si mas adu ay attention kaysa din udum, dadin ngay special ay pupils. Maga paylang

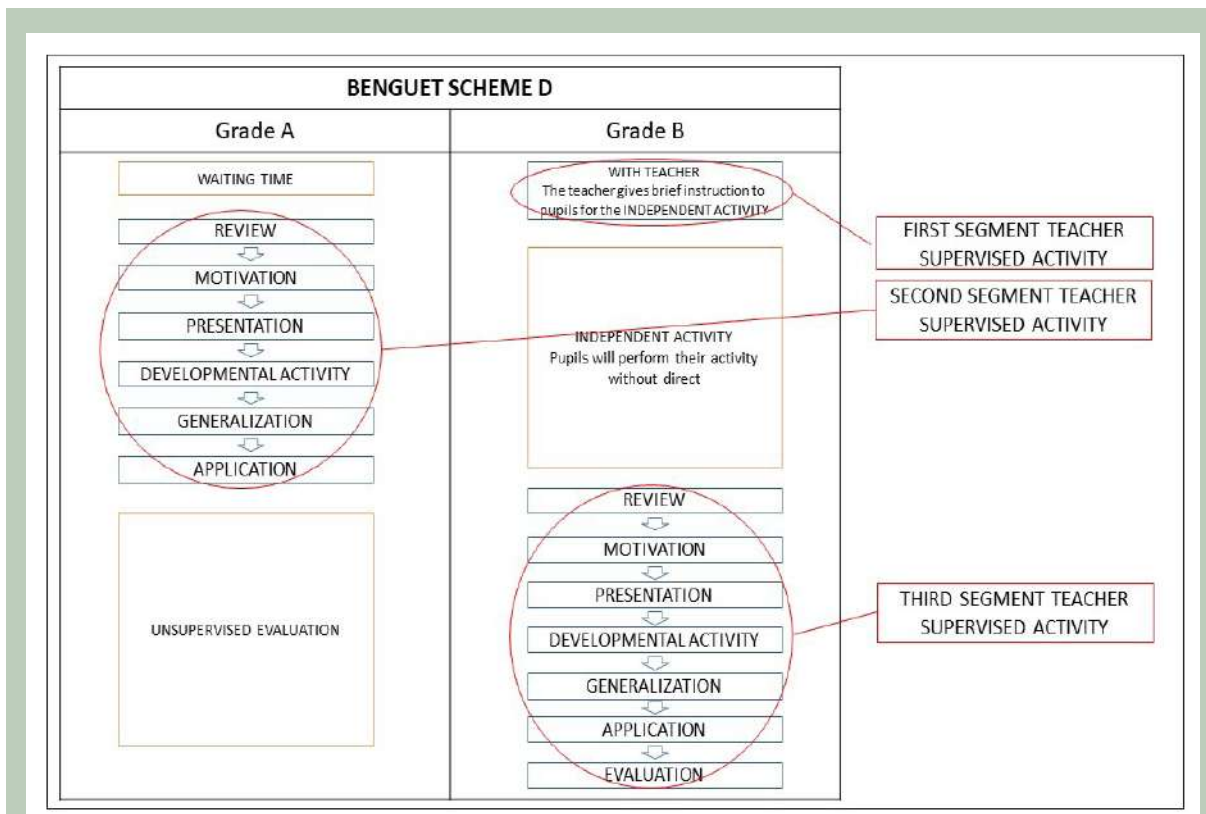


Figure 5. Three segments in implementing Benguet Scheme D



di scheme ay inamag di DepEd para sin kandana ay sitwasyon. Narigat ay manitdo si mono-grade ay waday special learners ngem sepsep abe sin multi-grade (It is hard to work and learn under the multi-grade conditions especially if there are pupils needing more attention than the others, I mean the special pupils. DepEd did not yet come up with a scheme that will deal with this kind of situation. It is hard to teach mono-grade with special learners but it is even harder in a multi-grade).

So based on the observations, during the first segment, less than half of the teachers were able to implement the suggested Benguet Scheme D process. While some of the teachers were not able to implement it due to situations beyond human control, most claimed that their deviation is for the better.

Teacher-supervised activity in second segment.

The second segment of a teacher-supervised activity starts from review or presentation and must end with an application activity before a teacher can shift to the other grade and start the third segment which is completing the same process as the second segment. Basically, this implies that the teacher will or should focus on one grade at a time as suggested by the Benguet Scheme D structure.

But in reality, among the seven observed teachers, only one teacher immediately started supervising and completing the process of the second segment before shifting to the other grade. The teacher was able to implement the presentation of lesson until generalization but was not able to give an application activity. Instead, an independent evaluation work was given to the pupils right after generalizing the lesson due to lack of time and in consideration of the need of employing a supervised teaching-learning process on the other grade. It is also significant to mention that the situation was affected by the presence of the learners with special needs in the multi-grade class that diverted the attention of the teacher from time to time during the supervised learning segment.

Pawlowicz (2001) presented an interesting idea that those who have had little or no experience with inclusion of learners with special needs have a hard time dealing with them. He also said that students with special needs are difficult to work with, take

a lot of the teacher's time and create classroom disruptions.

On the other hand, three teachers started the second segment through a short review of the previous lesson followed by giving of instructions for an independent unsupervised activity to one of the classes while the other class are still working on their independent task, which was given earlier in the first segment. Though this situation is not reflected in the original format of Benguet Scheme D, some of the teachers said that some of the Schools Division of Benguet supervisors suggested the process of conducting a review of previous lessons before giving instructions for an independent unsupervised activity.

After the review and giving of independent task, the teachers shifted to the class who just had their independent work to start with the presentation of the new lesson. Since the class had a short independent unsupervised activity prior to the presentation of the lesson, the teacher utilized the outputs to discuss the new lesson. Though there is a similarity on how the teachers started the second segment of the supervised teaching-learning process, the resemblance was not carried all along. Only two of the three teachers proceeded to completing the whole second segment. They continued until they were able to finish the application activity of the pupils before shifting back to the other grade to give supervision for the third segment.

While the two of the three teachers followed the second and third segment set-up with just a little deviation from the suggested format of the Benguet Scheme D, one of them shifted to the other grade during the developmental activities, which is just halfway to completing the second segment. In actually, the teacher had multiple shifting of supervision to the combined grades during the developmental activities. This is a big alteration of the suggested Benguet Scheme D structure. Due to the process implemented by the teacher may be considered to be a different scheme from the existing Benguet Scheme D. This teacher was not the sole teacher to do so. Another set of three teachers did the same as this teacher did during the developmental activities. Even if they started differently since these teachers started with a review and continued to completing the presentation, and discussion without shifting while the other grade in the combined class are working independently, they were the same during the course



of the developmental activities. The multiple shifting of supervision during the developmental activities marked the commonality among these teachers. However, these teachers had different reasons and claims in doing so. Some of them admitted that it was part of their teaching plan to conduct multiple shifting during the developmental activities while the others did not intend to do so but the situation calls for it. Most of the reasons of the teachers are anchored on the importance of giving productive and interactive activities. Ibrahim and Al-Shara (2007) emphasized that interactive learning has advantages that can respond to the needs of 21st century learners.

Teachers Kris, Rose, and Joy intended to implement multiple shifting in supervising both of the combined grades during the developmental activities to permit the giving of interactive activities and immediate interventions and corrections in different forms to the learners. In addition, they claimed that the immediate follow-up from the teacher through series of questions is vital to give a better chance of clearing the questions and doubts of the learners about their lesson. In support, Teacher Rose stated that:

Maymayat eshan jen eg era mebay an ja manubda ni ebayabayag, anyway ket karakdan manshemag di era nu marama independent actvivy. Disturboen shaak atan sota eshum eskwedan nu kami mandiscuss. Isunga nandecide ak jen icut ko so independent work et mandiscuss ak. Mayat panalternate era mebantayan (It is better not to leave the learners work independently for so long. Anyway, most often they ask many questions during their independent unsupervised activity. This will disturb me and my other pupils when we are discussing. So I decided to cut the independent work and discuss. It is good to attend to the learners alternately).

The multiple shifting of the teacher is not only to give better chance for learners to have a clearer thought of their lesson through immediate follow-up from the teachers. Behavior management is also a great reason. Accordingly, the prolonged without-teacher activity may cause boredom and disturbing behavior from some of the learners, which may further result to bigger problems. Teacher Kris said that:

Nu ibasar shi inunan tan paras ko, manmisbehave e pupils nu man-ubda era jen sisikara ne mabejag. Kwan ni eshum kait ja maestra jen depende nudta klase ni eskweda tan sota community jen naibilangan sha nem based shi paras ko, talaga jen edigat mecontrol era e anak nu nay-ulay era. Tan nu pinsak, nu meksheng e bayag jen waiting time eg mengekan ni mayat jen ubda isunga nansayang bengat ni oras tan materials. Eg nausal jen osto sota era gamit (Based on what I have seen and experienced, pupils tend to misbehave when they work on their own for so long. Some teachers say that it depends on the type of learners and the community where they belong but based on what I have experienced, it is really difficult to control the children when they are left on their own. And sometimes, after a long waiting time the pupils cannot give me good outputs so it became just a waste of time and materials. The materials will not be used properly).

In contrast to this claim, Teacher Jean who completed the presentation until application before shifting to the other class did not agree with the multiple shifting. She pointed out that the pupils would not be able to follow through the lesson if the teacher will not complete the whole process before transferring. Accordingly, the continuous delivery of the teacher-supervised activity as suggested by the Benguet Scheme D structure will allow clearer but thought-provoking scenarios for the learners, which is very important. To be specific, she stated:

Ngento epasing ni pupils mengevat ngay nu ijokot ni maestro e manshift? Mesepol evatan jen osto ni eskweda e lesson ta nu clear e lesson mebedin mengekan e maestra ni mengepanemnem jen activity. Eg mepasamak iyay nu ijokot ni maestra e etan. Aliven tuloy-tuloy. Edigat para shi anak karkaru nu bado e lesson. Mebedin siguro jen mengekan ni short discussion asan mengekan ni worksheet jen shagus nu follow up lesson bengat (How will the pupils understand if the teacher will keep on shifting? The pupils need to understand the lesson well and when the lesson is clear the teacher can give more supervised thought provoking



activity. This will not happen if the teacher will keep on transferring. There is no continuity. It is hard for the learners especially if the lesson is a new topic. Maybe, the teacher can give short discussion then give worksheet immediately if the lesson is just a follow up lesson).

Teacher Ely has the same idea as Teacher Jean's regarding the importance of an uninterrupted teacher-supervised activities. However, according to Teacher Ely, there are situations where the teachers are not supposed to shift or have multiple shifting but they are forced to do so. Some of the most common reasons that a multi-grade teacher needs to shift his or her attention during the course of discussion are sudden misbehavior of the independent class, early finish of independent tasks, and frequent asking of question of the learners having independent tasks. On the case of Teacher Ely, she was supposed to start the lesson on the class that had their independent task but was obliged to shift back to the previously supervised class. This was because the independent task of the learners is not yet finished. This situation was further explained by Teacher Ely:

Ekak pinlano jen manshift ne nak mandiscuss nem mesepol eshan say eg mesayang e oras. Sota plan ket plano bengat. Singa metlang shi mono-grade mebedin tayo metlang jen mansadat ni plano shi multi-grade nu marama eh teaching process. Wara e sitwasyon jen eg meplano karkaru sota kinaspas ni pan pick up ni eskweda. Isunga nu pinsak naha man-adjust (I did not actually plan to shift while I am still discussing but it was needed so the time will not be wasted. The plan is just a plan. Just like in mono-grade we can also change our plan in multi-grade during the teaching process. There are situations that we cannot plan especially the pick up speed of the learner. That is why I sometimes adjust).

However, this situation would not occur if the process is instilled in the learners. Their awareness of the procedure under a multi-grade class will help them realize the importance of doing their obligations as learners. In addition, when rules and routine are firmly established in a multi-grade class, there

would be no huge complications during the teaching-learning process. Borden (2013) further explained that failure to implement effective classroom management, which includes firm rules, can lead to a level of continued frustration that pushes teachers to their breaking point. In this regard, Teacher Jean shared her idea that:

Para sunsikak, kadaga ni eskwedak e ubda ra tan sha kaunura e classroom guidelines. Baka, siguro, nu piyan mo jen mayat eh flow ni lesson, iparas mo jen establish e set of rules. This is based shi experience ko. Sha pay pan ikuwan jen importante e rules shi single grade. Mas karkaro jen importante shi multi-grade (For me, my pupils do their work and follows our classroom guidelines. Maybe, just maybe, if you want to make the flow of the lesson great, try to establish a set of rules. This is based on my experience. They even say that firm rules are important for single grade. It is even more important for multi-grade).

Teacher-supervised activity in third segment.

The third segment of the teacher supervision happens when the teacher shifts to the class that had a prior independent task. This would involve the complete process of presenting a new lesson and discussion which will be followed by a developmental activity. This segment would be concluded by an application activity after the generalization of the lesson was given. Moreover, this would mark the completion of the whole teaching-learning process of the multi-grade. The only remaining block to conclude a period for mathematics is an evaluation task for the learners.

The implementation of the third segment may be affected by how the teacher executed the second segment. As seen, when the time for the third segment was consumed by the teacher during the second segment of the teacher supervision. Aside from this, the prior independent work of the learners may also affect the process implementation during the third segment.

Another important factor that should be considered is the implementation of the teacher-supervised activity as a whole. If the suggested Benguet Scheme D structure is accurately executed, the boundary line between the second and third segment of the teacher-supervised activity will be



very apparent and clear. The teachers are expected to abide in this structure since they all claimed to use Benguet Scheme D.

Conversely, it is notable that more than half of the respondents crossed the boundary line between the third and second segment at the inappropriate time making it unclear which track they are trailing. The blurry situation was caused by the multiple shifting of the teacher in the middle of the teaching-learning process. The teachers already defended the occurrence of such situation with different reasons. Though the reasons of the teachers were practical and realistic, still, the process they employed broke the line discerning the second and third segment which are among the defining features of the Benguet Scheme D.

Somehow, even if most of the teachers evaded from this feature of the scheme, some teachers stood their ground and abided by the boundary between the second and third segments of the teacher-supervised activity as suggested by the scheme. To be specific, three of the seven teachers completed the whole second segment from presentation of the lesson until the generalization and application before shifting to the other grade. The teachers who implemented segment three of the teacher supervision only after finishing the second segment was complete defined Benguet Scheme D as teaching different grade levels at a separate process. It was aforementioned in the earlier interview statements that these teachers acknowledge the importance of the continuity of the learning process. Teacher Jean reiterated: *"Nan-inafel jen competencies, separate jen procedure, different grade levels, nem sesakey maestra, shi daem ni sakey classroom. Nem mesepol jen naorganized. Hatan e Benguet Scheme D (Different competencies, separate procedure, different grade levels, but only one teacher, inside one classroom. But, the flow must be organized. That is Benguet Scheme D)."*

The separate procedure mentioned by the respondents pertains to the separation of the two main segments of the teacher-supervised activity. While it is clear that the three teachers are well adapted to such characteristics of the scheme, it appears that most of the respondents rely on a common perception and way of defining Benguet Scheme D. This definition is centered on a common knowledge that Benguet Scheme D is a scheme that will cater to two or more different and uncommon objective or competency. To be exact, the first response of the

respondents when asked about Benguet Scheme D is the same as Teacher Kris's when she said: *"Mausal e Benguet Scheme D nu nan-inafel e objective ni sota nan-inafel jen grade (Benguet Scheme D is used if the objectives are different for each grade)."*

However, it appears that it does not necessarily connote that when the teachers defined Benguet Scheme D as a scheme that caters to two or more different and separate objectives then they separately develop the lessons of the learners in the suggested pattern of the scheme. The fact that more than half of the teachers were not able to show the defining line between the second and third segments while they claim to use Benguet Scheme D may give an assumption that Benguet Scheme D is not what it is when implemented in the classrooms.

Factors Associated the Effectiveness of the Multi-grade Teaching Scheme Used in Teaching Mathematics

The factors that affect the effectiveness of the schemes were associated by the teachers to time efficiency and level appropriate activities. To be more specific, Benguet Scheme A gives teachers' higher chances of using the time efficiently since it permits the teacher to teach the multi-grade class like a mono-grade. Furthermore, since Benguet Scheme A gives a chance for more efficient time utilization, the chances of completing the whole process of teaching and learning is greater as compared to Benguet Scheme D, which is a complete opposite of Benguet Scheme A when it comes to efficiency in time utilization.

On the other hand, the teachers were able to bring out observations that Benguet Scheme D allows the giving of more grade-level-appropriate-activities despite the supposed differences of activities of the combined classes. With this, the teacher is able to concentrate the activities for the learners to address their level of maturity and ability instead of being disturbed by deviating activities. Moreover, being able to group the learners according to grade level allows the teacher to detect the progress and problems of the learners easier especially that range of expected performance level of the learners is narrowed. This was further elaborated by Teacher Beng:

Mayat ti Benguet Scheme D nu panggep ti aligning ti activities ijay kaya ti ubing. Mas maestimatae nu ngento iakan jen dagen ni anak ta at least san kagradan



era talaga. Nu eshan saksahay era jen grupo masas lata sota gap ni kaya sha jen eakan isunga mejo edigat ngo maamtaan nu nakaawat era jen emen. Manmurmurag ka ngo bengat da nu asen mo scores sha waray ngato wara et ngo muwan eh eg to amta dendenka to (Benguet Scheme D is good when it comes to aligning the activities to the abilities of the learners. It is easier to estimate the type of activities to be given to the learners because at least they are under the same grade. If they are grouped as one the gap among what they can offer evident making it hard to see whether all of them understood the lesson. You will be left clueless when you see their scores where some are high while others are not able to show good results).

Operationalizing Mathematics Multi-Task Scheme: An Input to Multi-Grade Teaching

The Mathematics Multi-Task Scheme (MMTS) Model is designed by the researchers to develop two distinct learning competencies in mathematics that have no commonalities; thus needing separate teaching-learning process (Figure 6). The premise of developing the MMTS Model is the findings and observed implementation processes employed by the teachers in the District of Tublay. Furthermore, the scheme suggests equal distribution of teacher attention and independent opportunities for learners. The distribution made sure that the time consumed for each activity is appropriate. It is also made sure that learners will be given the opportunity to discover the lesson together with their peers. At the same time, the learners will be given the chance to express their learning individually.

The elements of the original Benguet Scheme D are utilized in the MMTS Model. However, modifications and revisions were employed to cater to the needs of the learners and to answer some of the problems encountered during the process implementation observation. Specifically, the scheme consists of 'joint motivation activity', 'prompting or review activity', 'shifting', 'with teacher or teacher-supervised activities', and 'without teacher or independent unsupervised activities'. The teacher-supervised activities is segmented into six segments. On the other hand, the independent unsupervised

activities consist of five segments.

Joint motivation activity. The joint motivation activity takes both of the combined grades as one during the motivation activity which will prepare both of the learners for taking another learning experience. Giving the motivation activity for both grades at the same time will minimize the use of time.

Prompting or review activity. Instead of simply waiting for the teacher, the learners will be given materials that will prompt their thoughts that will aid them in the later part of the teaching-learning process. Since this part of the process is done without the teacher, pre-prepared materials will simply be posted on the board by a pupil representative; thus, it must be established through routine. However, materials must not be limited to posted visuals and when possible, independent review activities may also be given to learners.

With teacher or teacher-supervised activity. The with-teacher activity is segmented into six segments where three segments are designated for each of the grade level. The first segment starts with a review, which is followed by the presentation of new lesson, and ends with giving of instructions for the independent group work. This will be repeated on the other grade as the teacher shifts and will be called as the second segment. The third and fourth segments consist of presentation of group outputs, developmental activities, and instructions for individual activity. This would be performed to both grades separately. The fifth segment starts with checking of individual outputs and ends with giving of evaluation activity. On the other hand, the sixth segment is almost the same as the fifth except that the teacher has the chance to conduct a supervised evaluation activity to one of the grades.

Without teacher or independent unsupervised activity. The without teacher activity is composed of five segments when prompting activity is excluded. The first and second segments are independent group works given to both grades after the presentation but before the developmental activities which would promote discovery skills on the part of the learners. However, these group works are not done simultaneously since one grade will be handled by a teacher while the other are doing their independent group work. The third and fourth segments are independent individual activities which are given after the developmental activities



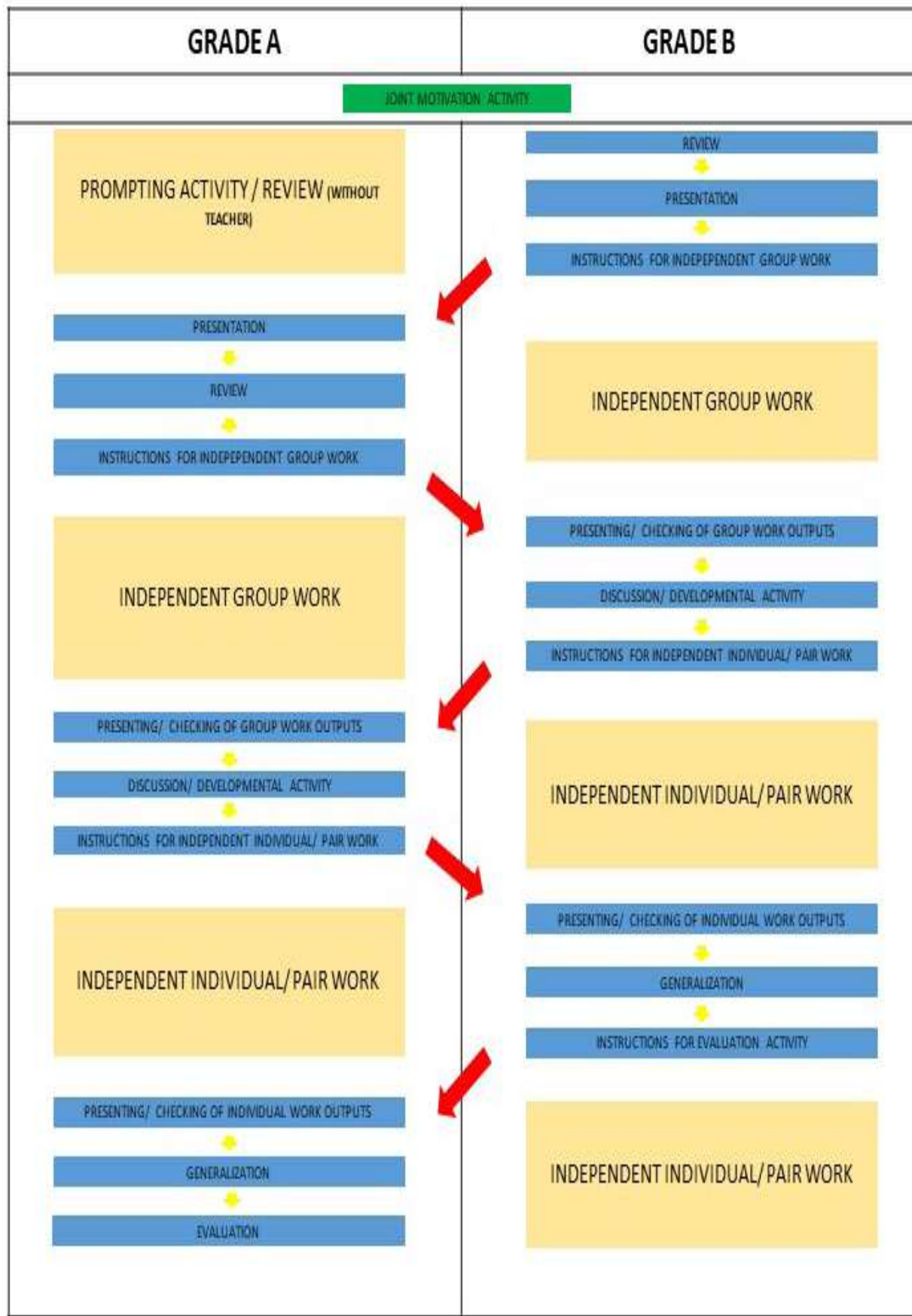


Figure 6. Mathematics Multi-Task Scheme (MMTS) Model

and discussion. The fifth segment is an independent evaluation work for one of the grades.

Shifting. Shifting is the act or process of transferring from one grade to another. In this scheme, the teacher would be expected to shift five times to cater to the needs of the learners.

Conclusions

The choice of scheme used in teaching mathematics in a multi-grade class is dependent upon lesson objective such that the teachers choose Benguet Scheme D since the objectives for each grade level is uncommon. Furthermore, the claim that teachers use Benguet Scheme D in teaching multi-grade mathematics is mainly anchored on the premise that the teachers develop separate and uncommon competency for each grade which was reflected on the results of the classroom observation where varied implementation processes were employed by the teachers while they claim to use Benguet Scheme D.

Recommendations

Multi-grade teachers' inputs might as well be considered in the crafting of ways of teaching multi-grade classes. Further trainings that would equip multi-grade teachers with more involvement in the utilization of the multi-grade teaching schemes. Further research should be conducted to find more reasons for deviations of teachers in the suggested multi-grade Benguet Scheme D. It is further recommended that studies regarding the effectiveness of the MMT scheme be conducted.

With the claim of teachers that a scheme has advantages over the other, teachers must not be concentrated on using few schemes. Instead, all schemes must be utilized and maximized to their full potential.

The Mathematics Multi-Task Scheme (MMTS) may be used by the teachers teaching mathematics in multi-grade. It is further recommended that studies regarding the effectiveness of the MMTS be conducted.

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