A PICTURE PAINTS A THOUSAND WORDS: A PHENOMENOLOGICAL STUDY OF MISCONCEPTIONS OF GRADE 7 MATHEMATICS TEACHERS ON DIFFERENTIATED INSTRUCTION IN THE PHILIPPINES

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Abstract

Differentiated Instruction has been found to be effective in catering to the individuality of students and at the same time helping students to have positive attitudes about school, increased engagement in learning, and improved achievement. Misconceptions of this type of instruction limit the teachers' response to student conceptions and ability to create challenging learning situations. For these reasons, researches on this topic are highly needed, especially in the Philippines, wherein, content differentiation is suggested in the implementation of the K-12 curriculum program, hence this study aimed to surface the misconceptions of Grade 7 mathematics teachers on differentiated instruction through the research question: What are the misconceptions of Grade 7 Filipino mathematics teachers on Differentiated Instruction? Data from the interviews of 21 Grade 7 Filipino mathematics teachers are qualitatively described

through this phenomenological study which utilizes the Colaizzi's Method to analyze data. The findings of this study surfaced the Grade 7 mathematics teachers' misconceptions on DI in the Philippines as fragmented ideas, and tagged them as head, heart, life, hand, road, and gadget. Fragmented because the respondents did not give the complete picture of DI but rather they provided characteristics of other teaching approaches related to DI. The findings are not surprising since DI came from the constructivist view, but DI has unique features and characteristics, and outside of these are all misconceptions. Hence, the respondents' notions of DI are as, "a picture paints a thousand words." Future researches are suggested out of the findings of this study such as "Determining the Effects of Relating Real Life Situations in Teaching Mathematics Lessons Utilizing DI" and "Challenges Encountered by Mathematics Teachers in Applying DI in Basic Education Institutions in Asia."

Keywords

1. Introduction

Differentiated Instruction has been found to be effective (Tomlinson, Brighton, Hertberg, Callahan, Moon, Brimjoin, Canover, & Reynolds, 2003) in providing the individuality of students (Brimijoin, 2005; Tieso, 2002) and at the same time helping students to have positive attitudes about school, increased engagement in learning, and improved achievement (Beecher and Sweeny, 2008; Cobb, 2010). Misconceptions of this type of instruction limits the teachers' response to student conceptions and ability to create challenging learning situations (Kleickmann et al., 2013). Misconceptions of teachers also hinder their ability to seek ways of teaching (Marx & Moss, 2011); create apprehensions to apply the appropriate teaching strategies (Balajadia, 2015); and lead them to a misconstruction of the learning standards (VanTassel-Baska, 2015). According to Chien (2015), the lack of know-how of a certain teaching approach results to poor implementation of classroom practices.

According to Tomlinson and Imbeau (2010), differentiation is not a set of instructional strategies, but it is a philosophy, a way of thinking or a principle about teaching and learning. Others explained that DI is not a single strategy, but rather an approach to instruction that incorporates a variety of strategies (Watts-Taffe, Broach, Marinak, McDonald Connor, &

Walker-Dalhouse, 2012); it is more a multiplicity of strategies within the classroom (Ruys, Defruyt, Rots, & Aelterman, 2013); it does not give some students more work to do and others less, rather, the teacher needs to adjust the nature of the work to respond to the varied needs of the specific student population (Konstantinou-Katzi, Tsolaki, Meletiou-Mavrotheris & Koutselini, 2013); this type of learning takes place within students (Tomlinson & Cooper, 2006), but this does not require customizing instruction for each student (Wormeli, 2005), only teachers support the needs of students in school through their teaching practices (McHugh, Horner, Colditz, & Wallace, 2013, cited by Perera & Hathaway, 2017). Learning activities in differentiated instruction do not refer to merely different learning activities but these should differ based on students' various needs (Hall, 2002) for differentiation can be done in the midst of instruction by using ongoing informal assessments so that teachers can have informed instructional decisions (Parsons, Dodman, & Burrowbridge, 2013); and teachers do not have to differentiate in every class (Chamberlin & Powers, 2010), but, only as needed (Logan, 2011).

Tomlinson identified three components in differentiated instruction (Hall, Strangman, & Meyer, 2003), namely: the content, wherein learning goals and materials used in teaching concepts are considered so that all the students learn the concepts, principles and skills effectively; the process by which the teachers facilitate the content and manage the students so that they grasp the lessons easily and effectively; and products which refer to the performance tasks and evaluations provided with options for students' engagement (Logan, 2011).

Moreover, DI is grounded on teachers' understanding of, and appreciation for students' unique needs, as well as their commonalities; and on teachers' proficiency with appropriately and creatively modified classroom elements, such as curricula, instructional strategies, learning activities, assessments, resources, and the learning environment (Tomlinson, 2000, cited in Santangelo & Tomlinson, 2012).

Aside from Tomlinson, others defined DI as having educational goals aligned with students' diverse learning needs (Matthews & Foster, 2009, cited by Wan, 2016); a teaching approach that recognizes students' needs in order for them to engage in any learning activities according to their learning preferences (Kanevsky, 2011); a teaching process whereby students have multiple options for taking information, making sense of ideas, expressing what they have learned and developing products so that each student can learn effectively (Tomlinson, 2001, cited by Beecher & Sweeny, 2008).

In a DI classroom, each student should be provided with resources, instruction, and support to help them meet the instructional objectives (Tomlinson & Imbeau, 2010) by basing the instruction on the students' potential and accommodating students' differences according to their readiness levels, interests, and learning profiles (Konstantinou-Katzi, 2012). It is more on scaffolding of advanced thinking skills and higher order questions as opposed to the direct instruction (Reis & Boeve, 2009), which is more on passive learning and allowing students to keep on moving forward regardless of their readiness level as long as they already performed the requirements (Roberts & Inman, 2007, cited by Taylor, 2015). It employs a multitude of teaching methods and activities to maximize academic success based on student readiness (Pham, 2012). Tomlinson (2005) suggested that it is necessary for teachers to provide various opportunities in accomplishing specified goals, so that each learner can progress to the highest degree possible. Teachers utilizing DI make use of strategies that address students' strengths, interests, skills, and readiness in flexible learning environments (Landrum & McDuffie, 2010). They provide flexible grouping of students (George, 2005) by interest and different levels of learning modalities (Manning, Stanford, & Reeves, 2010); various learning opportunities based on students' readiness levels, interests, and their learning profiles (Landrum & McDuffie, 2010; Cobb, 2010); and guided learning activities to match students' abilities and skills (Dalhouse et al., 2009).

Despite the various information on DI, there are researches which revealed that DI was applied incorrectly, hence, it did not facilitate learning. Manning, Stanford, and Reeves (2010) related that when DI is correctly implement, teachers know his or her learners' intentionality in greater depth, so that the students are led and guided beyond the basics of the curriculum. In the study of Rodgers (2004), although differentiation was done when students had their problem-solving interactions, it was observed that differentiation was not so clear to the students and consequently, it did not enhance learning. Also, in the study of Costigan (2013) about teachers' writing lesson plans by providing alternative exercises or supplemental materials for variously labelled students, students observed that their local teachers still had limited understanding of DI. In addition, Tomlinson stressed the significance of a clear understanding of the curriculum and its components to best apply Differentiated Instruction (Hoover & Patton, 2005).

The term differentiated instruction originated from the constructivist approach (Wan, 2016). This instructional approach has various proponents: Renzulli, a contemporary of Maker who initiated differentiated lesson plans across the curriculum (Beecher & Sweeny, 2008);

Tomlinson, a leading expert in this field, who outlined how to differentiated instruction according to students' readiness, profile, and interest (Tomlinson, 2005; Subban, 2006); and Maker and his co-authors (1982; cited by Kanevsky, 2011) who provided the guiding principles for the modification of learning content, process, product, and learning environment.

According to Kanevsky (2011), to avoid confusion regarding which differentiation is appropriate for most students, he suggested that the Maker principles for curriculum modification can be adopted, in which Maker explained that teachers can differentiate instruction in terms of the content of their lesson, how they process their lesson, students' product, and the learning environment, such as curriculum documents, worksheets and textbooks.

Since, the Philippines has adopted the K-12 Curriculum Program in the Basic Education in 2012, one of the implementation guidelines is to have content differentiation (Department of Education, 2012.), hence, this study on misconceptions of the respondents regarding DI is needed and timely.

Moreover, though there are a lot of researches on the framework and conceptual understanding of DI, there are limited study on misconceptions of Grade 7 mathematics, and there is blind spot in research on the misconceptions of a certain group of teachers regarding DI. Hence, qualitatively, this study sought answer to the research question: What are the misconceptions of the Grade 7 Mathematics teachers on DI? Qualitatively, specifically phenomenology is utilized since, the misconceptions of teachers are extracted from the lived experiences of the respondents.

For the above reasons, this study outlined the misconceptions of the Grade 7 mathematics teachers in the Philippines for the purpose that the findings of this study can be used to situate the misconceptions of the Grade 7 mathematics teachers and can be used to create a series of training activities to enhance content and pedagogical skills of teachers on DI.

2. Research Methodology

2.1 Research Design

This study captured the descriptions of DI as conceived by the Grade 7 mathematics teachers in the Philippines. The descriptions were made through qualitative research approach (Ritchie & Lewis, 2003) and these were concerned with details and particulars behind the constructs verbalized by the respondents (Harb, 2017; Congo-Poottaren & Beebeejaun-Rojee, 2017). Hence, phenomenology was utilized as Husserl (1970, as cited in Wojnar & Swanson,

2007) defined the intentionality and the meaning of lived experiences, from the first-person point of view; and according to Varvarigou, Hallam, Creech and McQueen (2013), it aims to capture the richness of experiences and the fullness of all the ways in which an experience and describes the phenomenon of interest. This research design was applied because the essence of this study is concerned with the lived experiences of the people who were involved.

2.2 Study Site and Selections

Manila consists of 16 districts: Binondo, Ermita, Intramuros, Malate, Paco, Pandacan, Port Area, Quiapo, Sampaloc, San Andres, San Miguel, San Nicolas, Santa Ana, Santa Cruz, Santa Mesa and Tondo, out of which six (6) of these were the study sites, namely: Ermita, Paco, Quiapo, Sampaloc, Sant Cruz, and Tondo. Twenty-one Grade 7 Mathematics teachers were purposively selected from the schools in the six district sites based on the following criteria: (a) applies Differentiated Instruction in Grade 7 Mathematics; (b) participates in seminars and trainings on Differentiated Instruction; and (c) a graduate of Bachelor of Secondary Education, major in Mathematics. These teachers were selected from the public and private schools of the six districts of Manila. A total of twenty-one classes of these teachers were observed.

2.3 Mode of Analysis

This study structured (Magrini, 2013, cited in Harb, 2017), reflected, and described the meanings of the lived experiences (Harb, 2017) of the Grade 7 mathematics teachers in relation to their misconceptions of DI. Utilizing the phenomenological research method, the constructs of the respondents were processed using Colaizzi's method (1978, cited by Shosha, 2010; Wojnar & Swanson, 2007).

The transcribed interview data were processed through word co-occurrence, word for word; then through cue words and related phrases (Atay & Danju, 2012). These words, concepts, themes, phrases, characters, or sentences within texts (Shahmohammadi, 2013) were presented and quantified based on DI. Data were analyzed utilizing the Colaizzi's Method (Wojnar & Swanson, 2007) using cool analysis (with-in and cross-case analysis) for text reduction technique (Catacutan & de Guzman, 2015) and warm analysis (utilizing a dendrogram) for categorization of data to surface the themes (de Guzman et al., 2008). This method includes: (a) reading and re-reading the participant's description; (b) extracting significant statements that pertain directly to the phenomenon; (c) formulating meaning; (d) categorizing the formulated meaning into clusters of themes that are common to all or majority of the participants; (e) integrating the findings into exhaustive description, including coding segments of textual topics;

(f) validating the findings by returning to some participants to ask how it compares with their own experiences; and (g) Incorporating any changes offered by the participants into final description of the essence of the phenomenon. It is noted that significant statements are non-mutually exclusive to a theme as DI is a broad concept and it can emanate from planning, implementation, and after instruction.

To avoid prejudgment and predisposition towards the phenomena as stated by Golafshani (2003) after cleaning (bracketing) the transcripts, the researchers considered all the statements of equal importance (horizons) (Arslan & Yıldırım, 2015). In phenomenology, the process of analysis also resides in the concept of epoché, which requires the elimination of suppositions, basing knowledge on intuition and essence, as opposed to empirical knowledge (Storrow & Georgakopoulos, 2013).

2.4 Procedure in Categorizing Misconceptions of Grade 7 Mathematics teachers

The meaningful statements of the respondents are marked misconceptions when they do not show a clear understanding of DI, or a complete description. After the horizontalization of data, meaningful statements were analyzed utilizing the Truth-value. In Logic, "if and then" is presented in Table 1, where p represents the conception of the respondent on DI and q represents the practice of the respondent on DI. Statements that belong to the 2nd, 3rd, and 4th rows were the significant statements for this study which were thematized. Themes were surfaced and linked to theoretical models. Themes were presented using metaphors. Metaphor analysis explores a logical framework called conduit metaphor, a belief that figurative language transfers information and thought to others through words, phrases, sentences and so on (Longnecker, 2004).

Table 1: *Truth-value Table (Yamasaki, 2004)*

p	Q	p $\square$> q
T	T	T
F	T	T
F	F	F
T	F	F

To ensure the reliability of the coding, this study employs both intra-rater and inter-rater method. The principal author conducted the intra-rater reliability test by repeatedly coding the significant statements from the transcribed data until it falls under the right code, while inter-

rater reliability was done by the two authors, applying the kappa value to determine the strength of the agreement of the two raters (Stemler, 2001).

3. Findings

The study sought the answer to: What are the misconceptions of Grade 7 Filipino mathematics teachers on DI? Themes were generated from the responses given by the teachers based on their personal knowledge of DI. The respondents had different ideas about DI, hence, the general theme was named as "A picture paints a thousand words." The general theme was conceptualized due to the fragmented ideas of the respondents on DI. The fragmented ideas were categorized and served as sub-themes as follows: head, when the notion of the respondent teacher about DI was about the readiness level of the students; heart, when the notion on DI was about the interest of students; life, when DI was about real-life situations; hand, when DI was about learning activities; road, when DI was about teaching strategies; and gadget, when DI is about gadget or technology.

3.1 Head

The cognitive domain of students is one of the important aspects to be considered in planning and providing instruction. It is essential for appropriating the learning objectives and learning tasks, and evaluating students' performance. Academic achievements, mostly marked with a numerical rating or its equivalent, are bases of identifying one's mental ability aside from the IQ test. This theme comes from the dominant statement of the respondents that DI has something to do with designing instruction with consideration of students' mental ability, but, the respondents failed to say that consideration of students' mental ability meant to appropriate learning activities and performance tasks so that students can do the learning activities and performance task according to their readiness level.

As one respondent stated: "Differentiated Instruction, I have observed some of them are weak in Math and the activity does not match with their capability (R9)."

Another said, "In my opinion, differentiated instruction is applicable for fast learners. As we know, these types of learners are more enthusiastic to explore compared with slow learners. But then, one disadvantage of this instruction is time consuming and the preparation. We, as teachers, are focused on lesson planning and paper works. But giving attention to students, I believe that differentiated instruction is good for them (R13)."

3.2 Heart

There is a common saying, "Where your heart is, there is your treasure." Students love to do what they are interested in. DI claims to have positive effects if the learning activities are based on students' interest. In this study, the respondents mentioned that DI is about tapping students' interest in learning mathematics, nevertheless, the respondents have the misconception that DI is not applicable for everyday learning activity and it is all about motivation, i. e. in DI the interest of the students is tapped to motivate learning. As one respondent narrated: "But I had an idea where I think it is good to have DI if not every day yet, because first of all, it will tap the interest of the students being aware that not all of them are good in Math (7)." Another respondent said, "Actually, one of the things I've learned from the DI seminar were the strategies on how to motivate and encourage students in learning and the application of it (R1)."

3.3 Life

There is a common saying: "Experience is the best teacher." Every day, students learn from the things around them. Relating real life situations to the lessons is a powerful medium to connect the lessons to the students' realm. It must be real to the world of the students. One respondent mentioned: "We already have in mind that the students should learn and we want, every time we teach, we are able to impart something to them that can be applied outside the school. That's what makes every strategy similar according to what I know (R4)."

3.4 Hand

Mathematical concepts are abstract. To concretize, the abstract becomes real to the senses of the students. Learning activities are utilized to unfold the abstract concept to less abstract. This is also the notion of the Grade 7 mathematics teachers on DI. One teacher explained, "In my opinion, the similarity of classes using the differentiated approach is that the students do hands-on activities. However, when it comes to lower sections, I've seen that that they like more what happened yesterday. They appreciated it much when they were in the corridors. Even though measuring the corridor is difficult, they've appreciated more the way of doing it, that it's better we already have rulers instead of using hands for measurement. Isn't it discovery approach when you make the students do an activity then from there, you'll get the concepts. That I think is the similarity (R2)."

3.5 Road

In a class, teachers are pivotal persons; they provide the road maps in learning and utilize techniques and strategies in order for the students to go to their respective learning destinations.

DI makes more evident the strategies of teaching among the respondents. One respondent said, "It is more on manipulative devices. Aside from projectors, which schools often acquire, I think it's more on manipulative devices to get the attention of the learners. Before, we just use Manila paper. Although, it still used today, even I use it until now. I feel more comfortable using it. But if I will be having manipulative devices, if I will be reading some from books, especially the newly released ones, I'll adapt it and have it followed to really differentiate. It is more of getting the discussions more active than usual (R11)."

3.6 Gadget

Generation Z is the mark for the present day students. They are technologically advanced and adept in using gadgets such as tablets and smart phones. Aside from the latest gadgets, some teachers refer to DI for using manipulative materials. One teacher said, "DI is more on using different kinds of manipulative materials which can add up knowledge of the student (R3)." While, one private school mathematics teacher related that DI is more on using the latest technology, "Making instruction different from the traditional instruction that we did before, the instruction should be relevant with the technology that is being introduced especially in the private schools (R18)."

The sub-themes generated from the above-mentioned statements of the respondents were metaphorically translated by the researchers who considered the level of capability of the students as head; students' interest as heart, the real-life situation as life; learning activities as hand; teaching strategies as road; and the learning tools and materials as gadgets.

4. Discussion

The misconceptions of the respondents on differentiated instruction are due to their incomplete conception or misunderstanding of DI.

One notion about DI is based on the capability of the students, which was thematized as 'head'. In this study, some respondents verbalized that DI considers the level of students wherein the students are categorized as slow and fast learners, but, they failed to cite situations wherein the learning objectives, learning activities, and performance tasks were modified to accommodate different readiness levels of students. They also revealed in their lesson plans that the learning objectives they prepared were applicable to all learners. However, DI stresses that students are not alike and students learn in different ways and at different rates (Muthomi &

Mbugua, 2014), hence, the learning objectives, learning activities, and performance tasks must be appropriate to the different levels of readiness and learning styles of students.

Another misconception of the respondents is that learning activities are based on Bloom's taxonomy and students' readiness as revealed in the study of Ghazalia, Othmanb, Aliasc, and Salehd, (2010), wherein teachers needed to classify the learning activities based on the Bloom's taxonomy. The respondents' notion is a misconception because using Bloom's taxonomy for learning objectives is not exclusive to DI. Learning objectives according to Maker's (Kanesvky, 2011) principles of DI are modified to accommodate the different levels of students, hence, two or more learning objectives should be made to accommodate the differing cognitive levels of students, however, in this study, only one learning objective append to a cognitive domain as shown in the respondents' lesson plans.

Another misconception of respondents on DI is their consideration of the students' interest, which the researchers coined 'heart' as a sub-theme. The respondents have an idea that DI tapped the students' interest but their notion is considered a misconception because they associated interest only to the multiple-intelligences by Gardner when providing learning activities, but, DI suggests that learning must be aligned to students' gifts and interest (Subban, 2006). Hence, this notion can only be applied in DI if the learning activities are designed to accommodate the students' interests. In DI, the learning activities in the classroom accommodate the various needs and interests of the students as mentioned in the study of Santangelo and Tomlinson (2012). Also, in DI, students should have equal chances to exhibit and develop their interests in particular and different from the other students (Rachmawatia, Muh. Nu'man, Widiasmarab, & Wibisono, 2016).

Still another misconception of the respondents on DI is about relating the lesson to real life situations which was thematized by the researchers as 'life'. The respondents considered that the real-life situations in utilizing DI make students active in doing the mathematics tasks, but this notion can be associated with other teaching principles that emphasize contextualizing the lesson, whereas in DI, the real-life tasks must conform with the real-life situations of the students and are based on the interests of the students. Hence, not all real-life situations are applicable to all students nor can all stimulate students' interest and engagement (A. Stylianides & G. Stylianides, 2008).

In terms of the learning activities, thematized as 'hand', the respondents' misconception on DI is about letting the students form groups in a class. This teaching principle can be

associated to collaborative learning. This notion can be DI only if the groupings are made based on students' preferences, interests, readiness levels, and profiles. Phillips and Popovic (2012) expressed that instructional methods utilizing group performance pay attention to various learning styles of the students in helping students' learning. In addition, Tomlinson et al. (2003) posited that in DI, teachers consider different instructional materials and groups based on students' learning interests, hence, making students learn more.

When DI is all about teaching strategies, such misconception was thematized as 'road'. DI is not all about teaching strategies (Tomlinson & Imbeau, 2010), rather it observes the principle on how the lesson is to be presented to accommodate students' various needs, levels, preferences, and profiles. It is a misunderstanding that differentiation is a set of instructional strategies (Imbeau, 2011 cited by Tomlinson, 2015). Another misconception, according to Costigan (2013) is that teachers assume that teaching is all about passing of facts; this account is evident among some respondents, who facilitated lessons through lectures and required less of leaners' participation. Tomlinson (2000, cited in Subban, 2006) emphasized that differentiation is not just an instructional strategy, nor is it a recipe for teaching, rather it is an innovative way of philosophy about teaching and learning.

Conception of DI as using tools and technology in the classroom was thematized as 'gadgets'. Some respondents from the private schools related that DI is more on using computers and social medias for real time updates and uploads of their performance tasks. This misconception of DI could be corrected, if the assignments and learning tasks uploaded were designed in line with students' preferences and levels. Phillips and Popovic (2012) related that in differentiated instruction, reteach the material according to each student's needs, for too often they lack the tools or time to get enough information, therefore, computerized learning is more than glorified.

Other misconceptions by some of the respondents about Di was that it was for students with special needs and it was difficult to implement. This finding is supported by the study of Weber, Johnson, and Tripp (2013), wherein teachers believed that differentiation was only for students with special instruction and that it was far too complex to implement in a regular classroom. Similarly, Orlich et al. (2004, cited in Pham, 2012) said that teachers should discretely consider the instructional components when differentiating instruction, and need to consider the connection of the components and recognize the relationship of the best teaching strategies, optimal analysis, and evaluation.

The fragmented concepts of DI by the respondents resonate with other researches. Chien (2015) cited that the teachers' lack of competence, time, and collaborative lesson planning resulted to failure in implementing DI in terms of content in their daily classroom practices. This finding has been verbalized by some of the respondents who admitted that they were not familiar with DI.

The fragmented ideas of the respondents on DI can be attributed to the various pedagogical shifts which took place in the Philippines. Some of these include Understanding by Design, 21st Century Learning, and Multiple intelligences, all of these are anchored on constructivism by orientation are similar related to DI. The Program for the Decentralization of Education (PRODED) has been implemented in 1990's up to the present, where teachers have been trained not to engage in rote learning but rather in contextualization of lessons to the students' real world (Visconde, 2006). Hence, the confusion of the respondents is based on their existing orientations on teaching.

It is not surprising that the tone of interpretations of the respondents on DI was fragmented. It is due to some of the similarities of the pedagogies. These ideas can be interchangeable as constructs of DI. Hence, due to these orientations, an insider draws a line that the notions of the Grade 7 mathematics teachers on DI are merely based on the similarity of characteristics of DI to other teaching orientations upheld in the Philippines. Therefore, the above notions of DI provided by the respondents are misconceptions.

The findings can also be attributed to the novelty of this teaching approach in the Philippines, and the lack of DI training attended by the respondents. Those who attended the DI seminar-workshop shared that the DI training was just a part of the teacher training program for the K-12 curriculum. To date, they had no training exclusively for DI.

Many teachers experienced difficulty in implementing the principles of DI within their repertoire of instructional strategies, because, in addition to insufficient teacher training and preparation, the implementation of DI is often hindered by a lack of support and encouragement from their immediate superior in utilizing DI (Holloway, 2000, cited by Smit & Humpert, 2012).

There is a need to address these misconceptions of teachers, as Tomlinson (2005) said, "the more the teachers have a clearer idea of DI, the more these teachers can provide more differentiations and the more the needs of the students will be met," hence, the findings are significant.

5. Conclusion

This study outlined and thematized the misconceptions of Grade 7 mathematics teachers in the Philippines. After the rigorous text analysis of the transcribed interview responses, misconceptions of the respondents on DI were clustered, thematized, and linked to the theoretical model (Maker's and Tomlinson's Model) of the principles on DI. The themes were metaphorically translated as head, heart, life, hand, road, and gadgets. The general theme was named as "A picture paints a thousand words."

Some of the respondents interchangeably related the features of DI to other teaching approaches such as the discovery and learner-centered approach; and the strategies, such as the multiple intelligences and collaborative learning. Hence, the respondents did not have a clear and complete picture of DI. These findings are not surprising since DI comes from the social constructivist learning theory by Vygotsky (Subban, 2006) which lies in the social and interactional relationship between the teacher and the student. Tomlinson (2005) stressed that the clearer the understanding of DI by teachers, the more it can be properly implemented; and the more differentiations in the classroom, the more chances of students to engage in learning Mathematics. This engagement in learning means higher academic achievements.

The study describes the misconceptions the Grade 7 mathematics teachers regarding DI. It shows the lack of readiness of the Grade 7 mathematics teachers to implement DI correctly in order to comply with the implementation guidelines of the K-12 Curriculum Program as mandated by DepEd. Also, the findings intended to add to the existing narratives regarding misconceptions about DI that can be utilized thereafter by other researchers and policy makers.

This study established the status of the misconceptions of Grade 7 mathematics teachers in the Philippines and can be a source of data and information for future researches on DI and teachers' misconceptions.

However, the findings of this study only create a moderatum generalization, hence, parallel study on misconceptions of Grade 7 mathematics teachers using quantitatively research approach is suggested. Also, it is suggested that the following topics be undertaken by other researchers: "Determining the Effects of Relating Real Life Situations in Teaching Mathematics Lessons" and "Challenges Encountered by Mathematics Teachers in Applying DI in Basic Education Institutions in Asia: A Comparative Study." The study also suggests a transformative training program on DI. According to Çelikler and Kara (2011), when there are misconceptions

among teachers, appropriate educational program should be developed and implemented to eliminate misapprehensions about a certain topic.

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