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DIFFERENTIATED INSTRUCTION AND CONVENTIONAL INSTRUCTIONAL APPROACH IN IMPROVING THE MATHEMATICS PERFORMANCE OF GRADE IV PUPILS IN OLONGAPO CITY, ZAMBALES, PHILIPPINES

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Abstract

The traditional approach using "One size fits all" model, wherein students are subjected to the same teaching styles and evaluation methods irrespective of their ability or interest, is the classroom approach being used by most of the teachers in teaching their learners. The purpose of this study was to test whether Differentiated Instruction leads to better pupils' performance in Mathematics vis – à – vis conventional instructional approach which assumes "one size fits all.". The study was conducted at District III - A in the Division of City Schools, Olongapo City. Experimental pre – test/post – test design was used in this study and utilized both qualitative and quantitative research methods. Quantitative research methods allowed the researcher to analyze achievement data for significant variations between classrooms. Moreover, Qualitative techniques permitted the researcher to collect data through observations, survey and interviews. These techniques enabled the researcher to know the nature, readiness, interest, and learning profile of the pupils and used the same information to differentiate every lesson he will deliver. Results of this study show that differentiated instruction yielded a greater increase in the mathematics performance of the Grade IV pupils. This result then confirmed that teachers should consider pupils' learning styles and abilities before the application of differentiated instruction. This provides the teacher with the necessary information to differentiate for choice and interest, two manageable techniques with which to begin differentiation.

Keywords: *Differentiated Instruction, Multiple Intelligence Theory, Conventional Instructional Approach*

INTRODUCTION

"One size fits all". This is the classroom approach being used by most of the teachers in teaching their pupils. It is ineffective way of instruction since two extremes of students, the high and the low, are not appropriately challenged according to Koeze (2007). It will not be appropriate to use this approach in different subjects especially in Mathematics because each pupil has his/her own learning style in answering mathematical problems.

One of the hardest subjects for the pupils is Mathematics. Most of the pupils find difficulty in this subject, wherein most of them tend to fail it and some tend to have anxiety of it. According to Dr. Muthomi (2014), et. al., Mathematics is an essential discipline recognized worldwide and it needs to be improved in education to prepare pupils with skills necessary for achieving higher education,

career aspirations and for attaining personal fulfilment. Because of this, teachers need to help their pupils overcome fear in Mathematics by not using "one size fits all" approach but rather employ different strategies that will suit the different learning styles of pupils. This can be done using their own strength, intelligence, ability, and potentials in doing tasks and instructions assigned to them.

Teachers must know well the potentials and strength of each of their pupils which they will use in giving or providing experiences or instructions and tasks that will address their needs and preferences which will to improve learning for each pupil. This approach is called Differentiated Instruction.

According to Tomlinson (2003), differentiation indicates giving students multiple options for taking in information. Differentiating instruction means observing and understanding the differences and similarities among pupils and use this information to plan instruction.

As Hall (2004) has said, differentiation is recognized to be a compilation of many theories and practices. Based on this review of the literature of differentiated instruction, the "package" itself is lacking empirical validation. "There is an acknowledged and decided gap in the literature in this area and future research is warranted". Research is needed to determine if differentiated instruction increases student achievement. While some educators feel it is a necessity for their students, others do not feel like the extra work and preparation is worth the time. The findings of this study will be a foundation for future studies as to the achievement effects of differentiation. If achievement data are statistically different between the classrooms that are showing evidence of differentiation, and those that are not, this may change the way teachers teach and the way universities prepare students to become educators, (Koeze, 2007).

HYPOTHESES

The study hypothesizes that differentiated instruction influences the performance of the pupils positively. It then tests the following null hypotheses.

- There is no statistically significant difference between the Grade IV class exposed to differentiated instruction and to those exposed to conventional instructional approach.
- There is no significant relationship between pupils' Learning Profile and mathematics performance.

METHODOLOGY

Research Design

The Experimental pre- test/post – test design was used in this study. The researcher used both qualitative and quantitative designs because according to Koeze (2007), review of research supported the fact that both qualitative and quantitative research methods were suited to this kind of study. Quantitative research methods allowed the researcher to analyze achievement data for significant variations between classrooms.

Moreover, Qualitative techniques permitted the researcher to collect data through observations, survey and interviews. These techniques enabled the researcher to know the nature, readiness, interest, and learning profile of the pupils and used the same information to differentiate every lesson he will deliver.

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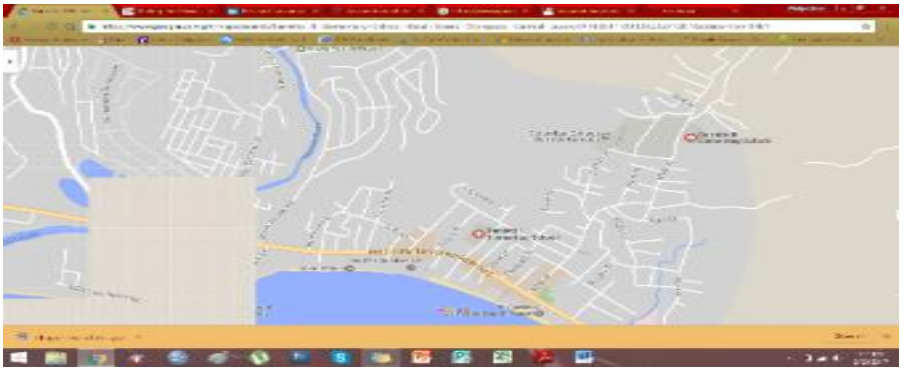
RESPONDENTS AND LOCATION

This research was conducted in two selected schools of District III - A in the Division of City Schools Olongapo City. Grade IV pupils of these schools were the targeted participants of this research.

Both schools are situated at barangay Barretto, Olongapo City. Figure 3 presents a map showing the exact location of Barretto I and Barretto II Elementary Schools.

Figure 1
Map of Barretto I and Barretto II Elementary Schools



The selected classes were heterogeneous and equivalent classes so that the result later is valid. One of the two selected classes was exposed with differentiated instruction while the other class was exposed to conventional instructional approach.

INSTRUMENTS

The main instrument used in this study included the pre – test and post – test which aided the researcher in determining the grade IV pupils' level of performance in mathematics. The test questionnaires were administered to the pupils.

Two primary tests were administered: the Pre – test, which determined the level of performance of the grade IV pupils in mathematics before applying differentiated instruction. Items in the Pre – test include the skills taken from the lessons that were taught for the third quarter. The second primary test that was administered on the data is the Post – test. This was administered after applying differentiated instruction to determine if the objectives were attained. The results of these tests were tabulated, analyzed and interpreted.

A secondary data gathering tool was also utilized. This is the survey checklists to identify the interest, learning styles and preferences of the pupil respondents. Data gathered in this tool was used as a guide in motivating the pupils to actively participate in the different formative activities. It also determined if the interest, learning styles and preferences of the pupil respondents affect the mathematics performance of the pupils.

The instruments were validated and finalized. It was administered to selected respondents not included in the study. Item analysis followed to guide the researcher as to what items are to be

retained, modified or deleted.

DATA COLLECTION

Prior to the conduct of the study, the researcher conducted diagnostic test to all grade IV classes in the district to ensure that the researcher selected two classes that were equivalent. It also determined their present level of performance in mathematics. Contents of the test included the prerequisite skills taken from the lesson prior to third quarter.

One of the selected classes was given a survey questionnaire, which was used to identify the learning profile of each pupil. This helped the researcher plan and differentiates every lesson based on the nature, readiness, interest, learning style, and learning profile of each pupil.

After the pre – test and pre - assessment, actual teaching followed using differentiated instruction following the teaching procedure. Same procedure was used to the other class which was used conventional instructional approach. The only difference was on the assessment and activities administered to them because it was not differentiated, and only use one type of activity for all the pupils.

Finally, the pupils were given Post – test to enable the researcher to know how effective differentiated instruction is to the pupils. The same data were used to know if there is statistically significant difference between the Grade IV class exposed to differentiated Instruction and to those exposed to conventional instructional approach.

Furthermore, the data gathered was based in the performance of the pupils in their formative assessment. These were tabulated, summarized, compared, and be interpreted separately to draw conclusions.

DATA ANALYSIS

To analyze the data gathered, this study used the frequency and percentage distribution, item analysis of observation and mean analysis and prepared rating scale. T - Test and Correlation Analysis were used also in this study.

Mean analysis was utilized to determine the level of performance of the respondents after the application of differentiated instruction.

Scale Range	Qualitative Interpretation
0-8	Poor
9-16	Fair
17-24	Good
25-32	Very Good
33-40	Excellent

The results of pre – test which was given to the pupils before the conduct of Differentiated Instruction and the post – test which was given to the pupils after the approach was applied were compared and analyzed through the use of mean analysis and standard deviation.

T – Test was used to determine if there is significant difference between the mean scores of the Post

test of the two grade 4 classes.

Pearson Product Moment Correlation Coefficient. Correlation Analysis was used to determine if the Learning Profile are related to mathematics performance. Learning profile is described by the type of intelligences and learning styles that the pupils have.

RESULTS

Table 1 shows the learning profiles of the Grade IV pupils in terms of multiple intelligence and their learning styles.

Table 1: Multiple Intelligence and Learning Styles of Grade IV Pupils Multiple Intelligence.

Multiple Intelligence			Learning Style		
	Mean	Qualitative Interpretation		Mean	Qualitative Interpretation
Linguistic	7.12	High	Visual	19.10	Often
Logical-Mathematical	7.75	High			
Spatial	7.77	High			
Musical	5.63	Average	Auditory	17.65	Sometimes
Interpersonal	5.13	Average			
Intrapersonal	5.83	Average			
Bodily Kinesthetic	7.48	High	Kinesthetic	16.70	Sometimes
Naturalistic	7.12	High			

(Scale: 1-2 Very Low, 3-4 Low, 5-6 Average, 7-8 High, 9-10 Very High) *(Scale: 1-6 Never, 7-12 Seldom, 13-18 Sometimes, 19-24 Often, 25-30 Always Applies)*

Among the multiple intelligences of the Grade IV pupils, Spatial Intelligence turned out to be the intelligence where most of them possess (7.77 - **high**) while interpersonal intelligence is their least intelligence (5.13 - **average**). Based on Howard Gardner's Multiple Intelligences, this implied that the pupils have the ability to perceive and represent the visual-spatial world accurately. While on the other hand, they have low ability to organize people and to communicate clearly what needs to be done.

Data also revealed that the three intelligences (linguistic, logical – mathematical, and spatial) where students rated "**high**" were those of great importance to perform in mathematics.

Learning Styles. Table 1 also shows data on what learning styles do the Grade IV pupils apply in mathematics subject. The data revealed that the pupils are more likely to be visual learners (19.10 – **often**), than auditory (17.65 – **sometimes)** and kinesthetic (16.70 – **sometimes**) learners. This implied that the pupils prefer using pictures, images, and spatial understanding to learn in mathematics more often than using sound and music, body, hands and sense of touch. This supported the statement of Koeze (2007) that for visual learners the teacher may pass props around that are related to the lesson for the students to see and touch.

LEVEL OF PERFORMANCE IN MATHEMATICS

Table 2 shows the comparison of mean scores of Grade IV pupils in mathematics during the pretest

and the posttest. Variability and mean scores describes the performance of the two sections.

Gleaned from the table, the two groups of Grade IV pupils have almost the same variability after the administration of the pretest, as measured by their standard deviation. Section Mars had a standard deviation of 4.408 and Rose had 4.982. Section Mars on the other hand garnered a mean score of 12.83 (**fair**), which is lower than the mean score of Section Rose (18.49 – **Good)**.

Table 2: **Mean Scores of Pupils on the Pretest and Posttest**

Section	N	PRETEST			POST TEST		
		Std. Deviation	Mean	Qualitative Interpretation	Std. Deviation	Mean	Qualitative Interpretation
Differentiated Instruction	40	4.408	12.43	Fair	1.852	29.15	Very Good
Conventional Instruction	38	4.982	18.49	Good	3.741	22.74	Good

(Scale: 0-8 Poor, 9-16 Fair, 17-24 Good, 25-32 Very Good, 33-40 Excellent)

This result prompted the researcher to choose the section (Mars) who had lower mean, to undergo differentiated instruction. The result of posttest revealed that section Mars become more homogeneous (SD=1.852) compared to section Rose (SD=3.741). The mean of section Mars (29.15) was already at "Very Good" level of performance and the mean of section Rose (22.74) was only at "Good" level. This increase on the level of performance of section Mars is accounted to the application of differentiated instruction in mathematics. This is supported with the statement of Sternberg & Zhang (2005) that it is imperative that students are provided with instruction that supports their abilities and remedies their weaknesses.

DIFFERENTIATED INSTRUCTION LEADING TO INCREASE ON THE LEVEL OF PERFORMANCE

Table 3 presents the t-test comparing the results of the pretest and posttest of the section (Mars) applied with differentiated instruction. At a set level of significance ($\alpha = .05$) and a degree of freedom (df=39) the tabular value 1.6766. The researcher formulated a null hypothesis, which states, "The mean score on the post test is not significantly higher than the mean score on the pretest" and underwent testing using t-test.

Table 3: **Difference between the Pretest and Posttest**

Section Mars	df	Computed t	Tabular t	Sig.	Interpretation
Pretest - Posttest	39	15.711	1.6766	.000	Significant

The computed value of t=15.711 is greater than the tabular value of t=1.6766 with Sig.=.000 which is also less than the set level of significance ($\alpha = .05$). This implied rejection of the null hypothesis, hence the mean score on the posttest is significantly higher than the mean score on the pretest. Therefore, differentiated instruction leads to the increase on the level of performance of Grade IV (Section Mars) pupils in Mathematics. This affirms the findings of Tomlinson and George (2004) that when implementing differentiated instructional strategies, there is the potential that the disparity in today's achievement scores among students gradually diminishes.

COMPARING THE MATHEMATICS PERFORMANCES DERIVED THROUGH DIFFERENTIATED

INSTRUCTION AND CONVENTIONAL INSTRUCTION APPROACH

The result of the t-test comparing the mean scores of section Mars (differentiated instruction) and section Rose (conventional instruction) is shown on Table 4. Conducting the t-test at a set level of significance (α = .05) and a degree of freedom (df=76), the tabular value of t=1.6652. The researcher formulated a null hypothesis, which states, "The mean score of section Mars is not significantly higher than the mean score of section Rose after the intervention" and underwent testing using t-test. The computed value t=4.469 is greater than the tabular t=1.6652 with Sig.=.000 which is also less than the set level of significance (α = .05).

This signifies rejection of the null hypothesis, hence the mean score of section Mars is significantly higher than the mean score of section Rose. Therefore, there is a significant difference between the Grade IV class exposed to differentiated instruction (Section Mars) and to those exposed to conventional instruction (Section Rose) approach.

Table 4: **Difference between the Differentiated Instruction and Conventional Instruction Approach**

Post Test	df	Computed t	Tabular t	Sig.	Interpretation
Differentiated Instruction - Conventional Instruction Approach	76	4.469	1.6652	.000	Significant

This confirms the statement of Yuen and Hau (2006) that teachers who structure the learning experiences in their classrooms through the use of varied instructional techniques (differentiated instruction) stand a better chance of producing learners who are motivated to learn and take responsibility for their learning. Subsequently, Tomlinson (2005) also stated that a student's readiness level is dependent upon information regarding a certain topic that has been previously understood, practiced, and conceptualized which affirms the findings of the researcher.

RELATIONSHIP BETWEEN LEARNING PROFILE AND MATHEMATICS PERFORMANCE

Table 5 shows the correlation between the learning profile of Grade IV pupils and performance in mathematics of Grade IV pupils. The learning profile variable includes multiple intelligence and learning styles of the pupils while the pupils' scores on the posttest measured the mathematics performance.

It can be gleaned that among the multiple intelligences, linguistic (.286), logical-mathematical (.614), spatial (.782), and bodily-kinesthetic (.326) intelligences are associated with mathematics performance. This confirms the findings of Voltz, Sims, Nelson & Bivens (2008) that students who possessed verbal-linguistics intelligence can apply their dynamic written and oral communication skills in the analytic problems solving in mathematics. Furthermore, logical-mathematical intelligence relate to learners who had exceptional skills when dealing with the quantification of observations. This also confirms the findings of Diaz-Lefebvre (2006) that these students were "number smart" as they were able to compute calculations with ease. Gardner (1983) stated that students who exhibited logical-mathematical intelligence were interested in dealing with abstract, numerical ideas that followed certain steps or formulas that were relative to commonly accepted reasoning strategies.

It can also be gleaned from the table that visual, auditory and kinesthetic learning styles of Grade IV

pupils had a correlation coefficient r=.040, .166, .109 respectively. These coefficients were interpreted as weak positive correlation. Visual learning style had Sig. (2-tailed)=.048 which is less than the set alpha level α = .05, hence there is a significant relationship between visual learning style and mathematics performance. Auditory learning styles of pupils had Sig. (2-tailed)=.035 which is also less than the set alpha level, hence there is a significant relationship between auditory learning style and mathematics performance. The kinesthetic learning style of pupils had Sig. (2-tailed)=.109 which is less than the set alpha (α = .05) implying a significant relationship between kinesthetic and mathematics performance.

Visual intelligence embodied the necessity of visual competency and a focus on interpretation and design. Learners who possessed spatial intelligence exemplified their creativity skills with pictures and illustrations to express their understanding of information. This supports the statement of Haley (2004) that students also displayed their spatial intelligence through the creation of graphs, diagrams, computer slide shows, multimedia projects, mind mapping, and graphic organizers.

The auditory learner makes use of their skill in retaining formulas and techniques in solving math problems. The findings of the researcher that auditory learning style is related to mathematics performance also confirm the findings of Hatt (2007) auditory learners used this skill to assist them in memorizing information.

Table 5: **Correlation between Learning Profile and Mathematics**: m**Performance of Grade IV Pupils**

			Post Test	Interpretation
MULTIPLE INTELLIGENCE	Linguistic Intelligence	Pearson Correlation	.286*	Weak Positive Correlation
		Sig. (2-tailed)	.043	Significant
		N	40	
	Logical-Mathematical Intelligence	Pearson Correlation	.614*	Strong Positive Correlation
		Sig. (2-tailed)	.018	Significant
		N	40	
	Musical Intelligence	Pearson Correlation	.288	Weak Positive Correlation
		Sig. (2-tailed)	.072	Not Significant
		N	40	
	Interpersonal Intelligence	Pearson Correlation	.239	Weak Positive Correlation
		Sig. (2-tailed)	.138	Not Significant
		N	40	
	Intrapersonal Intelligence	Pearson Correlation	.213	Weak Positive Correlation
		Sig. (2-tailed)	.186	Not Significant
		N	40	
	Naturalistic Intelligence	Pearson Correlation	.195	Weak Positive Correlation
		Sig. (2-tailed)	.228	Not Significant
		N	40	
	Spatial Intelligence	Pearson Correlation	.782	Strong Positive Correlation
		Sig. (2-tailed)	.002	Significant
		N		
	Bodily-Kinesthetic Intelligence	Pearson Correlation	.326	Weak Positive Correlation
		Sig. (2-tailed)	.038	Significant
		N		
LEARNING STYLES	Visual	Pearson Correlation	.040*	Weak Positive Correlation
		Sig. (2-tailed)	.048	Significant
		N	40	
	Auditory	Pearson Correlation	.166	Weak Positive Correlation
		Sig. (2-tailed)	.035	Significant
		N	40	
	Kinesthetic	Pearson Correlation	.109*	Weak Positive Correlation
		Sig. (2-tailed)	.025	Significant
		N	40	

In kinesthetic, the ability to use the body to relate to topics understudy allowed pupils to display creativity and ingenuity. This affirms the statement of McCoog (2007) that students also exhibit the use of movement in order to assist them in understanding information and analyzing problems.

These findings clearly describe the relationship between the learning profile and mathematics performance of Grade IV pupils.

DISCUSSIONS

The Grade IV pupils rated "high" on their linguistic intelligence (7.12), logical-mathematical intelligence (7.75), naturalistic intelligence (7.12), spatial intelligence (7.77) and bodily-kinesthetic intelligence (7.48) while they rated "average" on their musical intelligence (5.63), interpersonal intelligence (5.13) and intrapersonal intelligence (5.83). The four intelligences where students rated high were those of great importance to perform in mathematics. The pupils "often" use visuals to learn in mathematics and "sometimes" uses auditory and kinesthetic. The pupils prefer using pictures, images, and spatial understanding to learn in mathematics more often than using sound and music, body, hands and sense of touch.

The two groups of Grade IV pupils have the same variability after the administration of the pretest, as measured by their standard deviation. Section Mars on the other hand garnered a mean score of 12.83 (fair), which is lower than the mean score of Section Rose (18.49 – good) and this result

prompted the researcher to choose the section (Mars) who had lower mean, to undergo differentiated instruction. The result of posttest revealed that section Mars become more homogeneous (SD=1.852) compared to section Rose (SD=3.741). The mean of section Mars (29.15) was already at "Very Good" level of performance and the mean of section Rose (22.74) was only at "Good" level after the application of differentiated instruction.

The t-test comparing the results of the pretest and posttest of the section (Mars) applied with differentiated instruction revealed that the mean score on the posttest is significantly higher than the mean score on the pretest. This implied that differentiated instruction lead to the increase on the mathematics performance of the pupils.

The result of the t-test comparing the mean scores of section Mars (differentiated instruction) and section Rose (conventional instruction) revealed that mean score section of Mars is significantly higher than the mean score of section Rose after the intervention" and underwent testing using t-test. This implied that differentiated instruction lead to a more significant increase in the performance of pupils applied with the strategy.

The computed value t=4.469 is greater than the tabular t=1.6652 with Sig.=.000 which is also less than the set level of significance (α = .05). This implied significant difference between the Grade IV class exposed to differentiated instruction (Section Mars) and to those exposed to conventional instruction (Section Rose) approach.

Linguistic and bodily kinesthetic intelligence of pupils had a weak positive correlation with mathematics performance significant at α=.05. Logical-mathematics and spatial intelligence had a strong positive correlation with mathematics performance significant at α=.05. Musical intelligence, interpersonal intelligence, intrapersonal intelligence, and naturalistic intelligence of Grade IV pupils was interpreted as having weak positive correlation mathematics performance but are not significant at α=.05. This implied that the first two intelligence only had an effect on the performance of pupils in mathematics. Visual, auditory and kinesthetic learning styles of Grade IV pupils had a correlation coefficient r=.040, .166, .109 respectively. These coefficients were interpreted as weak positive correlation. Findings also revealed that there is a significant relationship between visual/auditory/kinesthetic and mathematics performance. These premises implied that the learning profile of pupils have significant relationship with their performance in mathematics.

CONCLUSIONS

Linguistic, logical-mathematical, spatial and bodily-kinesthetic intelligence played a vital role in learning mathematics. Additionally, the visual, auditory and kinesthetic learning styles of Grade IV pupils greatly contribute in increasing their performance in mathematics. After the application of the differentiated instruction, the performance of the experimental group in mathematics significantly increased. The fundamental notion of differentiated instruction encompasses the support of multiple intelligences. Differentiated instruction and multiple intelligences helped foster content literacy among struggling and reluctant learners. The application of differentiated instruction requires taking into account students' learning profiles. The researcher therefore concludes that differentiated instruction increased the mathematics performance of the Grade IV pupils.

RECOMMENDATION

Based on the gathered data and analysis of the results, the researcher came with these recommendations that teachers should be properly trained so that they understand the scope of this phenomenon and its propositions in order to fully implement differentiated instruction. They should also consider pupils' learning styles and abilities before the application of differentiated instruction and should recognize the need to provide differentiated instruction on their pupils' learning levels based on their identified or existing multiple intelligence. On the other hand, administrators should be aware that teachers are concerned with the lack of time for planning, range of ability levels in each classroom, and classroom management when providing materials and preparing lessons to meet the needs of diverse learners, hence infusion of differentiated instruction. It is recommended that a program that determines students' developmental mathematical readiness be examined for the differentiation of instruction. Following the professional development, a subsequent study could be conducted for comparison about how teachers' management abilities influence the implementation of differentiated instruction in the elementary classroom.

REFERENCES

[1] Dr. Muthomi M. W. and Prof. Mbugua Z. K. (2014). *Effectiveness of Differentiated Instruction on Secondary School Students Achievement in Mathematics*

[2] Hall T. (2004) et. al. Differentiated Instruction and Implications for UDL Implementation

[3] Koeze P. A. (2007). *Differentiated Instruction: The Effect on Student Achievement in an*d *Elementary School*

[4]http://pqdtopen.proquest.com/doc/192931211.html?FMT=AI. Believing everyone can learn: Differentiating instruction in mixed ability classrooms by *Brentnall, Kevin, Ed.D.* College of Saint Elizabeth. 2016: 249 pages; 10111279.

[5]http://pqdtopen.proquest.com/doc/1449660560.html?FMT=AI. Differentiated Instruction: Effects on Primary Students' Mathematics Achievement by *Maxey, Katherine S., Ed.D.* Northcentral University. 2013: 198 pages; 3573708.

[6]http://pqdtopen.proquest.com/doc/889959346.html?FMT=AI. A Case Study of Differentiated Instruction in Upper Elementary Mathematics and Reading Classrooms by *Burris, LaPonya Alexandria, Ed.D.* Walden University. 2011: 174 pages; 3469057.

[7]http://pqdtopen.proquest.com/doc/885179744.html?FMT=AI. The Impact of Differentiated Versus Traditional Instruction on Math Achievement and Student Attitudes by *Gamble, Valerie D., Ed.D.* Walden University. 2011: 145 pages; 3466511.

[8]http://pqdtopen.proquest.com/doc/192931211.html?FMT=ABS. The effect of learning styles strategies on benchmark eighth grade middle school mathematics achievement by *Ferrara, Jean*, Ed.D., Walden University, 2010, 110; 3397130

[9]Maxey, K. S. (2013). http://pqdtopen.proquest.com/doc/1449660560.html?FMT=AI. Differentiated Instruction: Effects on Primary Students' Mathematics Achievement. 2013: 198 pages; 3573708.

[10]Tomlinson, C. (2001). How to differentiate instruction in mixed ability classrooms (2nd ed). Alexandria, VA: Association for Supervision and Curriculum Development.

[11]Tomlinson, C., Brighton, C., Hertberg, H., Callahan, C., Moon, T., Brimijoin, K., et al. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of the literature. Journal for the Education of the Gifted, 27, (2/3), 119-45.

[12]Tomlinson, C. & Cunningham-Eidson, C. (2003). Differentiation in practice. Alexandria, VA. Association for Supervision and Curriculum Development.
[13]Tomlinson, C. & Eidson. (2003). Differentiation in practice: A resource guide for differentiating curriculum. Alexandria, VA. Association for Supervision and Curriculum Development.
[14]Tomlinson, C. & McTighe, J. (2006). Integrating differentiated instruction and understanding by design: Connecting content and kids. Alexandria, VA: Association for Supervision and Curriculum Development.