

## **Integrating Children's Literature in Elementary Mathematics**

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## **Abstract**

The purpose of this professional development project was to train teachers in using children's literature for math instruction and to also examine its effect on student math learning at an elementary school. Teachers were taught how to use children's literature to instruct and enhance their math curriculum through the use of literature pieces, manipulatives, and graphic organizers. For two weeks twelve fourth-grade students were taught long division using explicit teacher instruction without integrating children's literature, and at the end took an end of unit test on long division. Then, the students were taught long division using selected children's literature for two weeks and took the end of unit test again. Results indicate that using children's literature in math helps students understand and retain concepts more effectively. Selected quality children's literature can be effectively integrated in elementary math instruction to improve student math achievement.

## **Introduction**

What strategies can teachers use to ensure their students understand mathematical concepts? How can they make sure their students are engaged within the learning? How can one tie multiple subjects into teaching mathematics? How can teachers ensure test scores will be significant enough to keep their job? This is just a small list of many questions teachers ask themselves while teaching mathematics to young children. With the implementation of the Georgia Performance Common Core Curriculum teaching mathematics is not like it was in the "olden days" where students sat and completed problems using formulas all day. Teaching mathematics has evolved and encompasses so much more now. In the mathematics classroom teachers are not only responsible for teaching mathematics concepts but also processing skills such as problem solving and justifying. Teachers are now looking into different strategies to use in their classroom in order to meet all of these criteria and differentiate for their students to ensure maximum learning.

One strategy teachers have started to use is the incorporation of more children's literature in the mathematics classroom. According to Golden (2012), using children's literature while teaching mathematics provides a context for students. The pieces of literature provide a real-world context for students to fully understand many mathematical concepts. Even if students cannot see how the mathematical concept fits into their personal lives, they can see how the concept relates to the character within the piece of literature. Golden (2012) states students also develop the understanding of when, why, and how a certain mathematical concept is used when children's literature is read in math.

Within the past few years, teachers at the elementary have started to use more and more children's literature in the mathematics classroom. This was first to tie together the subjects of reading and math. However, as the years passed teachers have found students are more engaged and remember mathematical concepts more when they are presented the concepts in a story like manner.

Even though several teachers have used children's literature while teaching math there a still were teachers that only used the textbook and worksheets. These teachers were reluctant to incorporate subjects together and did not see the benefits of using these pieces of literature in the mathematics classroom. Professional Development sessions were necessary to convince and show these teachers the benefits of using children's literature within their mathematics classroom. Professional Development sessions gave all teachers a sense of confidence to use children's literature within their mathematics classroom as strategies and resources were shared with the teachers. The objective of this professional development session was to inform teachers of the benefits of using children's literature in the everyday mathematics classroom. Using children's literature in the math classroom is a way to bridge the gap for many students who have

struggled with math concepts in the past and are now leery of any math concept taught within the classroom.

## **Review of Literature**

### **Advantages of Using Children's Literature**

Using children's literature within mathematics instruction is not a new concept to teaching. However, many teachers do not integrate the use of children's literature into their math classrooms. The use of children's literature within the mathematics instruction was introduced in 1989 when the article "Curriculum and Evaluation Standards for School Mathematics" was written by the National Council of Teachers of Mathematics (Nesmith, 2008). Math is a hard concept to teach and learn as many of its concepts are abstract. Students learn to value mathematics through the use of children's literature and are able to understand many of the abstract concepts.

According to the National Council of Teachers of Mathematics (NCTM) the use of children's literature within the mathematics classroom has helped students reach these five goals outlined by the NCTM: students valuing mathematics, having math evident in students' everyday lives, students developing problem solving skills, students learning mathematical symbols and language in order to communicate with their peers, and students being able to use reasoning skills (Nesmith, 2008). The integration of math and literature has shown there is a connection between learning mathematical concepts and being able to interact with the story (Wilburne & Napoli, 2008) Through the use of children's literature in mathematics students can make many cross curriculum connections (Kinniburgh & Byrd, 2008). Using children's literature in math integrates reading and mathematical skills (Foley & McKeny, 2013). When students use literature to learn mathematical concepts, they are being provided with additional opportunities

to read, write, speak, and listen. This not only strengthens their mathematical understanding of the concepts but also reinforces the reading skills of main ideas, details, and summarizing. This literature combines numerical reasoning with reading skills. Foley and McKeny state many different reading skills students learn while using children's literature within the math classroom. Some of these are being introduced to new vocabulary, learning and using synonyms and antonyms, and even role playing of characters.

Students are motivated and engaged in learning when children's literature is used and are more apt to understand the concepts as it is presented in a story format (Wilburne & Napoli, 2008). Many students suffer from mathematical anxiety as they do not understand the abstract concepts and see how these concepts relate to the real world. However, the research shows that the use of children's literature helps these anxious students feel more comfortable within the math classroom as they are learning about a story instead of algorithms to memorize (Alkan, 2013). Not every student learns the same way and using children's literature allows the teacher to meet the needs of students who are visual, auditory, and in some instances kinesthetic learners. It also allows the students who struggle with math but excel in reading a chance to feel comfortable within the math classroom as they are getting to use their reading skills while they are working on math concepts (Ambrose, 2004). With the use of children's literature within math, students are able to fully understand and grasp abstract concepts, feel comfortable while learning, and remain engaged in the learning process.

McKeney and Foley (2013) state a classroom environment where children's literature acts as a basis in the classroom makes for a student-centered mathematics classroom. In this environment students have proven to remember mathematical concepts and obtain a deeper understanding of the concepts they were learning. Children's literature is fundamentally human

and reminds students of their own lives. This provides students with a narrative structure with which to develop mathematical thinking and language as they interact with the characters within the story.

Price (n.d) states students become engaged in mathematics when using children's literature. Students become engaged through making meaningful connections with the literature. The students often make many mathematical observations and develop questions based on the literature read. This leads to teachers being able to expand their students learning. Teachers can ask students to use charts and patterns to demonstrate their learning of the concepts taught within the book. An excellent activity for students to represent learning and remain engaged is having them create their own book to demonstrate their learning (Price, n.d).

### Special Education

Special education students have trouble with the concepts of mathematics because they involve several components: problem solving, geometry, computation, and reading (Maria, Pedron, Tressoldi, & Lucangeli, 2014). Traditional methods of teaching math do not help these students acquire the conceptual understanding of mathematics (Hong, 1996). Teaching math through the use of children's literature has become a suggested alternative to the traditional methods (Hong, 1996). Teachers can help these special education students by using a variety of instructional methods including using visual aids through the use of children's literature. The most natural way to learn a concept is through a story context (Casey, Erkut, Ceder, & Young, 2008). Children's literature provides a meaningful context as the mathematical skills is being told as a story. Students are able to then recall the information and are able to apply their mathematical knowledge (Casey, Erkut, Ceder, & Young, 2008). The use of story books gives these students situations in which they should use the mathematical concepts being taught in a

variety of situations (Hong, 1996). This helps students acquire the skills necessary to solve the rigorous Common Core mathematical task and apply their knowledge to use the NCTM process standards.

Shared reading is a research based instructional practice which enhances literacy skills as well as mathematical concepts being taught throughout as the text is read-aloud (Bowder, Lee, & Mims, 2011). During shared reading, students join in or share the reading of a book while being guided and directed by the teacher. Using shared reading with special education students engages them in the learning process by allowing them opportunities to interact with the story as it is being read a-loud (Hudson & Test, 2011). The students are engaged in the shared story reading with both the content and concepts of the book before, during, and after the read aloud (Courtade, Lingo, & Whitney, 2013). Shared reading allows the special education student a chance to gain information and concepts independently from the text as they are listening to them. This encourages self confidence within the student as they are able to learn on their own. (Courtade, Lingo, & Whitney, 2013).

Literature within math not only helps special education students with mathematical content but it also helps them with many literacy skills. With the use of shared reading, students with disabilities not only understand the math concepts which are taught through the book but are also becoming more literate as they are being exposed to more pieces of literature which also helps to increase their communication skills (Courtade, Lingo, & Whitney, 2013). Children's literature within math also helps special education students with both their social and emotional development as they are being provided opportunities to share their knowledge with their peers and are responding to each other's mathematical ideas (Hong, 1996). When using children's literature within math special education students are also working on their literacy skills as they

ask questions about the story, summarize concepts taught in the book, and many times are tracking the books print (Hudson & Test, 2011).

### Connecting Math, Reading, and Writing

Math and language arts are proven to have a strong connection (Yilmaz & Topal, 2014). Math performance is related to early reading skills. Studies have shown that math performance is related to a student's reading skills such as phonological awareness and processing (Steffani & Selvester, 2009). Literacy is an essential part of learning. All learning is literacy based, therefore literacy components such as reading and writing need to be addressed within the teaching of mathematics (Adams & Pegg, 2012). Language Arts help emphasize the importance of tools used in the NCTM process standards such as communication, multiple reasoning, and mathematical reasoning (Yilmaz & Topal, 2014).

Incorporating both reading and writing through the use of children's literature in the mathematics classroom has many advantages for students and their understanding of math concepts. Integrating language arts and math is a great instructional strategy for teachers to use especially through the use of children's literature (Zambo & Cleland, 2005). The use of language arts within math can enhance students' learning as they are communicating their mathematical ideas and reasoning through both speaking it verbally and writing (Yilmaz & Topal, 2014). Writing in math also helps students summarize or consolidate their learning as they have to reflect back on what they learned and explain it in their own words. Their explanation has to be clear enough so one of their peers can understand it and question it. The use of writing to explain thinking processes in mathematics allows students to practice rigorous mathematical tasks and use the NCTM process standards to explain and justify their answer (Pugalee, 2001).

The incorporation of literacy strategies and mathematics is an effective way for students to improve their understanding of the content (Adams & Pegg, 2012). One way teachers can incorporate literacy into math is through journaling. Journaling with math helps students reflect back on their learning and also helps with their mathematical vocabulary (Kostos & Shin, 2010). When students write in journals they fully understand the math concepts taught through the piece of literature and pick up on any misconceptions or misunderstanding they have which allows the student to ask the teacher for clarification before moving onto a different math concept (Zambo & Cleland, 2005). Math journals allow students to demonstrate their knowledge through the use of words and pictures. Drawing is a form of visual communication where students can show their mathematical understanding. Students can draw models to help explain their mathematical knowledge and justify their answer (Steffani & Selvester, 2009.)

#### Student and Teacher Use of Literacy within Mathematics

While using literacy in math there are many strategies which teachers can use to encourage students curiosity in math and strategies students can use to explore and justify their mathematical thinking. Teachers who use children's literature within their mathematical teaching have more interactive learning environments (Caprarp & Caprarp, 2006). When students use literacy strategies in math taught from children's literature their understanding of math content increases (Siebert & Draper, 2008).

Teachers can help students bridge the gap in their mathematical understanding through the use of children's literature in math. Using this helps students fully understand concepts on a deeper level which provides students with the resources they need to complete rigorous Common Core math tasks (Siebert & Draper, 2008). Teachers can use an excerpt or a passage from a piece

of children's literature to enhance students learning and engagement in math concepts (Siebert & Draper, 2008). When using children's literature in math teachers are helping students understand complex math vocabulary (Caprarp & Caprarpo, 2006). Students are then able to make connections between words and mathematical ideas (Caprarp & Caprarpo, 2006). For specific math vocabulary which students may be unfamiliar with teachers use graphic organizers (Phillips, Bardsley, Bach, & Brown, 2009). After using a piece of children's literature within math, teachers can use mathematical story problems which correlate to the concept to help students develop their metacognition skills, reading math illustrations and fully understanding them (Patton, Fry, & Klages, 2008). Teachers use higher order thinking questions with students to increase communication and depth in understanding of mathematical concepts (Adams, 2010). Technology is used to support literacy within the math classroom. Students use I-pads, cell phones, and computers to demonstrate knowledge (Siebert & Draper, 2008).

Students construct their own number stories after listening to a piece of children's literature on a particular mathematical concept. Number stories help students illustrate and demonstrate their mathematical understanding (Carroll, Fuson, & Diamond, 2000). When students complete real world problem solving tasks they work on their metacognition and mathematical problem solving skills (Patton, Fry, & Klages, 2008). Students write their explanations to mathematical tasks to justify their answers and incorporate real world thinking (Caprarp & Caprarpo, 2006). Students use mathematical vocabulary and reasoning to construct viable arguments with their mathematical tasks (Adams, 2010).

## Using Manipulatives with Mathematical Literacy

Teachers use a variety of activities to support the use of children's literature and extend students learning. Concrete manipulatives along with the use of children's literature helps students develop a better understanding of mathematical concepts (Yang, Lai, Yoa, & Huang, 2014). Teachers use manipulatives to reinforce a concept taught with a piece of children's literature to ensure students fully understand and grasp the mathematical concept (Puchner, Taylor, O'Donnell, & Fick, 2008). Manipulatives promote conceptual understanding of abstract concepts for students (Flores, 2010). Teachers use manipulatives to build student interest and self confidence in new concepts (Durik & Eccles, 2006). When students use manipulatives they are interested, active, and engaged in the lesson. The use of children's literature and manipulatives shows the relationships between manipulatives and mathematics. This enhances students' perceptions of math and encourages them to use manipulatives as tools to complete rigorous Common Core mathematical tasks (Moyer, 2002). Manipulatives help students explain their thinking both internally and externally. When using manipulatives to complete mathematical tasks, students fully understand the mathematical concepts. (Puchner, Taylor, O'Donnell, & Fick, 2008). Manipulatives help students work on the NCTM standard of representation as manipulatives support students' representational skills (Puchner, Taylor, O'Donnell, & Fick, 2008). Students justify their answer with their explanations and critique the reasoning of their peers. Manipulatives help students transfer their basic knowledge of mathematical concepts into more complex and rigorous tasks (Flores, 2010).

In conclusion, teachers using children's literature while teaching mathematics has many benefits and daily implications. Students will understand the concepts at a deeper level, have a

real-world connection, and be able to explain concepts learned to their peers. Students not only will benefit from the mathematical concepts being taught but the reading comprehension skills as well. Students will also benefit socially by having many opportunities to share their learning with their peers, teachers, and community in a variety of medias. Teachers can use literature in math on a daily basis as they introduce new concepts and work with their students.

## **Procedure**

### Design

This was a professional development project which was led by the teacher researcher. In this professional development session, forty-five teachers participated in the session to learn more about the use of children's literature in the mathematics classroom. Twelve fourth grade students in an already existing classroom at the elementary school were given two County end of unit mathematics test on long division. One test was taught with only teacher direct instruction and rote memory and practice the other test was taught with the use of children's literature, manipulatives, and graphic organizers which reflected the piece of literature.

To start this process, teachers of mathematics at the elementary school were asked to complete a survey on using children's literature within their own classroom. The survey gauged the teachers' understanding of using and implementing children's literature within the mathematical classroom.

Teachers then attended the professional development session and learned why and how to implement children's literature within their own math lessons. The professional development session began with watching the video "Math in Stories". Within this video, teachers were able

to see how a student explained how her teachers used the books “The Doorbell Rang” and “To Infinity and Beyond” to explain mathematical concepts. Within this video, the student not only read the books but gave step by step directions on division using base ten blocks with the book “The Doorbell Rang” and used the book “To Infinity and Beyond” to explain the concept of the number infinity. Using this video sparked teachers’ interest, they were able to see the many benefits of using children’s literature within the classroom. I then discussed how using children’s literature within the mathematics classroom has proven to aid in the learning, retaining, and understanding of complex mathematical concepts for many students.

I then provided teachers with specific strategies they could implement as well as resources to go to and look at children’s literature which matched with their current math standards being taught. Teachers then participated and were the “students” as I taught an example lesson using the piece of children’s literature “The Hershey’s Milk Chocolate Fraction Book”. Teachers used their own Hershey’s chocolate bar to manipulate as fractions as I read the book and demonstrated breaking the Hershey’s bar using an overhead projector. After the lesson, teachers were given a chance to talk with their team and discuss the demonstrated lesson as well as ask any questions about using children’s literature within the mathematics classroom.

Teachers were then given three to four weeks to implement the use of children’s literature within their own math lessons. During this time, teachers met with their grade levels on Tuesdays during Professional Learning and discussed the advantages and/or disadvantages they were seeing through using children’s literature while teaching math. Teachers also discussed questions they had and reported to me if they needed additional support and/or help. At the end of the four weeks, teachers came together and discussed the benefits they saw of incorporating children’s literature into their math lessons. They also discussed the difficulties and changes they would

make next time. At this time, teachers reviewed what pieces of literature were a great tool and resource to use and which ones were not and how they would tweak them to work next year. Teachers also talked about the ways they implemented children's literature in their own math lessons and if they used any follow up activities with the book, manipulatives, or graphic organizers as additional teaching tools. After teachers met within their teams and collaborated, I sent another survey to be completed as a grade level. Once the surveys were completed I then analyzed the surveys to determine the effectiveness of my professional development and addressed any additional concerns and questions with another brief meeting.

Over the next four weeks, the twelve fourth grade students met with their teacher who is also the researcher. For two weeks, the students were taught long division using only explicit teacher instruction and rote memory and practice. After the two weeks, the students took a County end of the unit test on long division. For the next two weeks, the students were re-taught long division. However, the teacher used children's literature to introduce the concept of long division as well as manipulatives for students to see how long division worked, and graphic organizers to aid in the learning of long division. After another two weeks, the students took the same County end of unit test on long division.

## Participants

Based on the needs of both my school and our students, the participants in this study were the teachers in grades kindergarten through fifth grade at my school. The school is located in the quaint and small Southern town. The school has a population of five hundred-sixty eight students enrolled in grades Pre- K through the fifth grade. Eighty percent of the students were white, seven percent were Hispanic, six percent were African American, and four percent were Asian.

The participants in this study included forty-five teachers at the elementary school. Ninety-seven percent of the staff was female and two percent was male. They varied from teaching the grades of kindergarten through fifth. The age of these teachers varied from twenty - three to sixty-five. Eighty-eight percent of the staff was white and eleven percent was African American. I also had participants that included nine fourth grade girls and three fourth grade boys. Seven of these students were served through the special education program at the school and five were served through the general education classroom at the elementary. Out of these students eighty three percent were white and seventeen percent were African American. Only twelve students were used as those are the twelve I served in the special education resource room at elementary school. Seven students were served in the special education resource room for all subjects except for science and social studies and the other five I served only in reading and English language arts in the special education resource room; they were in a general education classroom for math instruction. Therefore, I used these twelve students for my mathematical data collection.

#### Data Collection

In September 2014, the teacher gathered baseline data. Teachers at the elementary completed a survey indicating their knowledge and use of integrating children's literature into the mathematics classroom. The twelve chosen fourth grade students also completed a County math posttest in which teachers did not use children's literature to aid in the teaching or reinforcing of mathematical concepts. In November 2014, after four weeks of integrating children's literature in the mathematics classroom teachers retook the survey and the fourth grade students retook the County posttest. The second giving of the survey and test were given to

measure the effectiveness or how students scored and also the confidence of teachers integrating children's literature in mathematics.

### Data Analysis

At the beginning of this professional development, only 52 % of teachers used children's literature when teaching math and of that 71% used it only to introduce a new mathematical topic and not on a daily basis. However, 90% of teachers agreed and said their students liked math class when they integrated children's literature into the classroom. Only 14% of teachers integrated children's literature with mathematics on a daily basis, 28% once a week and 57 % once a month. Within the data, teachers said two things hindered them the most from integrating children's literature within the mathematics classroom, 85% said not having enough resources and 15% said they did not know strategies to integrate children's literature within the mathematics classroom.

After the professional development session and several question and answer sessions, the survey was resent and the results changed as many teachers were now integrating children's literature within their own mathematics classroom. Now 75% of our teachers are using children's literature when teaching math and 30% are using it every day. The teachers are integrating children's literature into the mathematics classroom in many different ways, 75% are using it to introduce a concept and 25% are using it to extend students' learning to deepen their understanding on mathematical concepts. However, 75% of our teachers still said they did not have enough resources and/or do not know where to find them. There is still 10% of our staff who did not know strategies to use in order to successfully integrate children's literature into the mathematical classroom.

Table 1: Results of Survey- Beginning and End of Professional Development

|  | Beginning of Professional Development | End of Professional Development |
|--|---------------------------------------|---------------------------------|
| Percentage of teachers using children's literature   | 52%                                   | 75%                             |
| Only used children's literature to introduce a topic   | 73%                                   | 75%                             |
| Used children's literature on a daily basis  | 14%                                   | 30%                             |
| Used children's literature on a weekly basis   | 28%                                   | 45%                             |
| Used children's literature on a monthly basis  | 57%                                   | 75%                             |
| Percentage of teachers who do not use children's literature in math because of lack of resources | 85%                                   | 75%                             |
| Percentage of teachers who do not use children's literature because lack of strategies           | 15%                                   | 10%                             |

Quantitative data of posttest 1 and posttest 2 were collected. To compare results of the test, t-test were used to compare posttest 1 and posttest 2. Scores were analyzed and used to determine the importance and significance of using children's literature in mathematics. The independent variable of this study is the instructional method, the use of integrating children's literature into the mathematical classroom. A series of posttest were given to determine the students' mathematical accuracy and understanding of the concept of long division. In the first posttest, students were taught long division using only the algorithm and explicit teacher

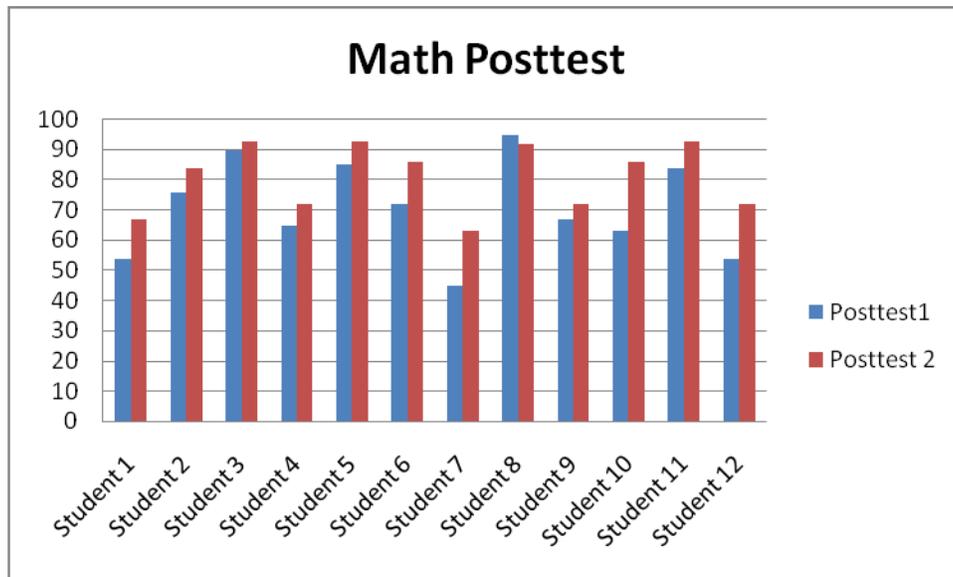
instruction. After the first posttest, the teachers went back and re-taught the concept of long division integrating children's literature, manipulatives, and graphic organizers which related back to the piece of children's literature used.

Raw data (Table 2) showed that student posttest 1 scores ranged from 45% to 95%. posttest 2 scores ranged from 67% to 93%. This was a point increase of three to twenty two. The results (Graph 1) indicate that the integration of children's literature into the mathematics classroom helped 92% of students increase their scores and understanding of the concept long division. The first posttest indicated 50% of students failed the test where as the second posttest indicated only 1% of students failed the posttest. Only one student's scores went down after the second posttest this could have indicated that the student is a higher level learner who had mastered the information previously and was bored.

Table 2: Posttest scores of Posttest 1 and Posttest 2 of long division

|            | Posttest1 | Posttest 2 |
|------------|-----------|------------|
| Student 1  | 54        | 67         |
| Student 2  | 76        | 84         |
| Student 3  | 90        | 93         |
| Student 4  | 65        | 72         |
| Student 5  | 85        | 93         |
| Student 6  | 72        | 86         |
| Student 7  | 45        | 63         |
| Student 8  | 95        | 92         |
| Student 9  | 67        | 72         |
| Student 10 | 63        | 86         |
| Student 11 | 84        | 93         |
| Student 12 | 54        | 72         |

Graph 1: Results of Posttest 1 and Posttest2



To compare students' posttest 1 and posttest 2 scores a t-test was used to see if there was a significant difference between the point gain in the two posttests (Table 3). The point gain was analyzed because each student is different and instead of the students' individual test scores used to determine if children's literature in mathematics instruction is important the two teaching techniques, explicit instruction for long division and the use of children's literature, needed to be analyzed to provide a fair comparison. The t-test indicated that there is a significance difference in using children's literature within the mathematics classroom. The effect size was 0.90 although the average only increased by ten points.

Table 3: Results of t-test comparing posttest 1 (explicit instruction) and posttest 2 (using children's literature)

|                        | Posttest 1<br>Explicit<br>Instruction | Posttest 2<br>Using Children's<br>Literature |
|------------------------|---------------------------------------|--|
| Number of participants | 12                                    | 12   |
| Mean                   | 71                                    | 81   |
| Standard Deviation     | 15                                    | 11   |
| DF = 11                |                                       |  |
| T= -4.9                |                                       |  |
| P Value= 0.000243      |                                       |  |
| Effect Size- 0.90      |                                       |  |

## Discussion and Conclusion

The implication of this professional development session took place over a span of four weeks. The topic was to incorporate children's literature into the mathematics classroom.

Through the professional development session teachers are now using children's literature 75% of the time and 30% of teachers are using it on a daily basis. Teachers are more willing to use children's literature within their own classrooms to aid in teaching concepts. Students' scores went up 22% when children's literature was used in to teach the concept of long division.

Today's students are faced with many mathematical challenges. Mathematics is critical to the success of students not only in school but in the real world as well. Students today are

expected to complete rigorous mathematical task instead of only computing an answer. Students are now required to make sense of problems and persevere in solving them, reason abstractly and quantitatively, critique the reasoning of their peers, model with mathematics, attend to precision, look for and make use of structure, construct viable arguments, and use appropriate tools strategically. These concepts are hard for students to understand and use as they are required to now think mathematically in a different way.

However, teachers need to realize and be informed that incorporating literacy into the mathematics classroom helps all students succeed and master these new rigorous Common Core task along with the NCTM process standards. Teachers use children's literature pieces as hooks within their lessons to engage students in learning and expand their knowledge on the why and how topics of mathematics. Students are able to use manipulatives within the context of these pieces of children's literature and fully understand and grasp mathematical concepts on a deeper level. With the use of manipulatives, students are able to construct meaning with their mathematical knowledge. Students are then able to verbally or through writing explain and justify their mathematical thinking. They are able to explain their reasoning to their teachers and able to justify to their peers why they used certain manipulatives and how it helped them come to the answer.

As teachers, we need to find ways to reach all of our students in math. Math is a difficult subject for many of our students. Some of them have already made up their mind and do not like and think they will never be good at math. However, with the use of children's literature within the math classroom students can see the fun of math. This builds the self-confidence which many of our students need in many aspects of their life.

Integrating children's literature into the mathematics classroom has many advantages for all students. It challenges those who understand the newly taught concepts as they are able to expand their learning. It also aids those students who need both visual and tactile use of manipulatives to understand mathematical concepts. With the integration of children's literature in the mathematics classroom, teachers are also meeting the new Common Core standard of teaching standards cross curricular. Students will be exposed to both reading and mathematical standards within one time frame.

A strength within this professional development session was the interest and application it has in a teacher's everyday teaching. Teachers at my school were very interested in learning more about how and why to integrate children's literature into their mathematics classroom. After the professional development session, teachers were eager to return to their classrooms and implement what they had learned right away.

Because of the small number of students and short period of time to implement the use of integrating children's literature into mathematics, results were not shown for more than one unit of study, long division. The same subject and posttest being used twice to determine effectiveness threatens the validity and reliability of the study. The results could be inflated as the same students were tested on the same concept. If the integrating of children's literature into the mathematics classroom had a longer duration and different posttest were used, it is possible that the results would have shown the integration of children's literature would have been beneficial in many aspects and concepts taught within the mathematics classroom.

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