

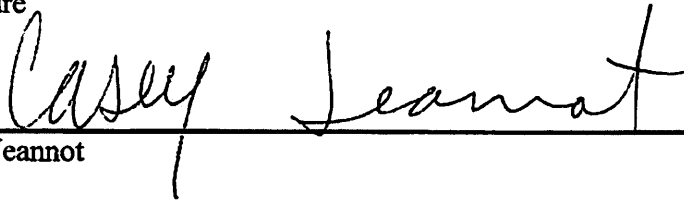
Heritage University Special Project Permission to Conduct Research

Permission has been given for Kylene Boddie by Casey Jeannot, to conduct an action research project as part of the Heritage University Masters Degree Program entitled Better Success in Multi-Age Classrooms. The Hypothesis of this study is the following:

First grade students who receive multiage class instruction in math will have equal to or higher scores on a chapter assessment than students who receive non-multiage grade level instruction. Students who received instruction in a multiage class will report that they feel more confident taking the chapter assessment.

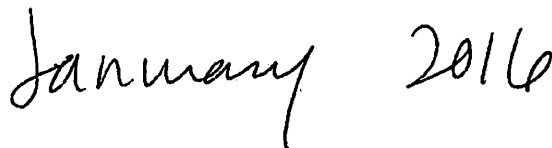
A copy of the project survey will be presented to the Casey Jeannot before being given. The results of the study will be shared with the Principal and other building departments as appropriate.

Signature



Casey Jeannot

Date



Complete the answer sentence.

Tim caught \_\_\_\_\_ fish.

- 12)** A pet shop has 15 cats, 10 dogs, and 10 fish. How many pets does the pet shop have in all? Write an equation in the boxes.

$$\boxed{\phantom{000}} \circ \boxed{\phantom{000}} \circ \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

Complete the answer sentence.

The pet shop has \_\_\_\_\_ pets in all.

- 9) Jonah has 10 counters. He gets 33 more. How many counters does Jonah have now? Show your work and complete the answer statement.

Jonah has \_\_\_\_\_ counters now.

- 10) Tara has 30 stamps. She uses 10 stamps. How many stamps are left? Show your work and complete the answer statement.

Tara has \_\_\_\_\_ stamps left.

- 11) Tim and Sam caught 37 fish in all. Sam caught 20 fish by himself. How many fish did **Tim** catch by himself? Write an equation for this story in the boxes.

$$\boxed{\phantom{00}} \ominus \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

5) Subtract

$$20 - 9 = \underline{\hspace{2cm}}$$

6) Subtract

$$\begin{array}{r} 42 \\ -10 \\ \hline \end{array}$$

7) What is the sum of  $5 + 7 + 5$ ?           

8) Find the sum.

$$\begin{array}{r} 6 \\ 5 \\ + 4 \\ \hline \end{array}$$

Appendix B

Copy of pre and post test

**Chapter 13 – Addition and Subtraction to 40**

1) What number belongs in the blank?

$$23 + 6 = \underline{\hspace{2cm}}$$

2) Find the sum.













$$4 + 36 = \underline{\hspace{2cm}}$$

3) Find the sum.

$$\begin{array}{r} 17 \\ + 14 \\ \hline \end{array}$$

4) Find the sum.

$$\begin{array}{r} 18 \\ + 20 \\ \hline \end{array}$$

7. I feel confident when taking a math test.	  
8. I look forward to math each day.	  
9. I do my math homework every week.	  
10. I enjoy independent math time.	  

Appendix A

Survey Questions

Name \_\_\_\_\_

I am doing a survey about math. Your input is important to me.  
Please answer the followi



Agree    Somewhat Agree    Disagree

1. I like math.			
2. Math is easy for me.			
3. I like doing math in a small group.			
4. I like hearing 2 <sup>nd</sup> grade math while I am working on my ipad.			
5. I like having 2 <sup>nd</sup> graders in class.			
6. I enjoy doing math with a partner.			

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<http://web.b.ebscohost.com.libdb.heritage.edu/ehost/pdfviewer/pdfviewer?sid=9ae1d3a7-ed3c-4e42-98d1-950f537592da%40sessionmgr198&vid=1&hid=123>

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<http://web.b.ebscohost.com/ehost/detail/detail?sid=3a6106c0-0e12-42af-a8f8-818a9e765111%40sessionmgr112&vid=0&hid=124&bdata=JkF1dGhUeXBIPWlwJnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=648602&db=pbh>

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[h](#)

Public Law 07-110 107th Congress an Act. (2002) pg. 15

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### Recommendations

Recommendations for future studies in knowing if multiage instruction is more beneficial than whole group instruction would be that the study and researcher needs a longer time frame to conduct the study. This study was done in only a couple of months during one school year. To get a more accurate assessment of students' growth and data, I would be more beneficial to assess students on a yearly district assessment as well as being able to track those same students over the next couple of years. This would allow me to see if the students that received instruction in a multiage classroom made more growth in math. It is also noted that not enough students were randomly assigned to be a part of this study. If this study were to be conducted again, I would use multiple multi-age first and second grade classrooms and single grade classrooms, in particular first grade classrooms. Making these few alterations to the study, might give me a more accurate assessment.

The research was done with 35 first grade students. 11 of the students received instruction in math in a multiage classroom and 24 of the students received whole group instruction in math.

This study helped determine if first grade students who received instruction in a multiage classroom in math had equal to significantly higher scores on a chapter math test than first students who received whole group instruction in math.

All 35 students took the Chapter 13: Addition and Subtraction to 40 pre and post test this school year in March 2016 and April 2016. The Chapter 13 test was used to show growth to determine if the hypothesis could be accepted or rejected.

### Conclusions

After conducting the study, gathering data, and evaluating the implications, the data did not support my hypothesis. Both groups of students made growth on their Chapter 13: Addition and Subtraction to 40 math test but neither class made significantly higher growth than the other. After giving a survey to 11 students who were apart of the multiage experimental group, eight out of eleven reported that they felt that they liked doing math in small groups and 11 out of the 11 strongly agreed or agreed that they liked hearing 2<sup>nd</sup> grade math while they worked on the ipads during independent work time.

## CHAPTER 5

### Summary, Conclusions and Recommendations

#### Introduction

This chapter has been organized around the following topic: (a) introduction, (b) summary, (c) conclusions, (d) recommendations.

#### Summary

Based on poor state funding, laws that impact class size, and the amount of English Language Learners enrolled, Hazel Valley Elementary in the Highline School District was a school who was overloaded with first and second grade students and because of this a multiage classroom was created to solve this problem. Eleven first grade students and thirteen second grade students, ranging in ability were placed in a classroom together. As a result, the teacher was able to in math, implement small group instruction and first grade students were also able to be present during the time of second grade math instruction.

difficult for researchers to generalize the academic impact of multiage education (Lloyd, 1999).”

According to the article, studies around multiage grouping have been inconsistent and that data is not entirely reliable. With the wide range of ways that multiage groupings are implemented, researchers are having a difficult time generalizing an sort of academic impact from these groupings. According to this study, first grade students who received non-multiage class instruction in math had higher scores on a chapter assessment than students who received multiage grade level instruction.

### Summary

This chapter was intended to analyze the data and identify the findings. From the data, the hypothesis was not supported and the null hypothesis was accepted.

Reasons included the short duration of project and class composition. The duration of the project was only over a span of several months and a small number of students were studied (34). Therefore, first grade students who received multi-age class instruction in math did have equal to or higher scores on a chapter assessment than students who received non-multi-age grade level instruction. However, the t-value of 1.30 did not reach the necessary 2.042 value to show significance. The null hypothesis was accepted, so hypothesis was not supported.

### Discussion

The results showed that first grade students who received multi-age class instruction in math did not have equal to or higher scores on a chapter assessment than students who received non-multi-age grade level instruction. In chapter 2 one of the articles that was cited stated that, "The current point of contention is whether multiage groupings help increase children's academic skills, and so far, the results of the few available studies are inconsistent. Slaton (1997) suggests that the forced assignments for both teachers and students in multiage classrooms might contribute to negative academic outcomes in some situations (Slaton et al., 1997), while Veeman (1995) attributes the prevailing confusion about multiage education to the inconsistent definition of multiage education. According to Lloyd (1999), the wide range of ways multiage groupings are implemented makes it

To the statement “I enjoy independent math time” five students agreed to the statement while five students somewhat agreed to the statement. There were one students who disagreed. The mean score was 2.00.

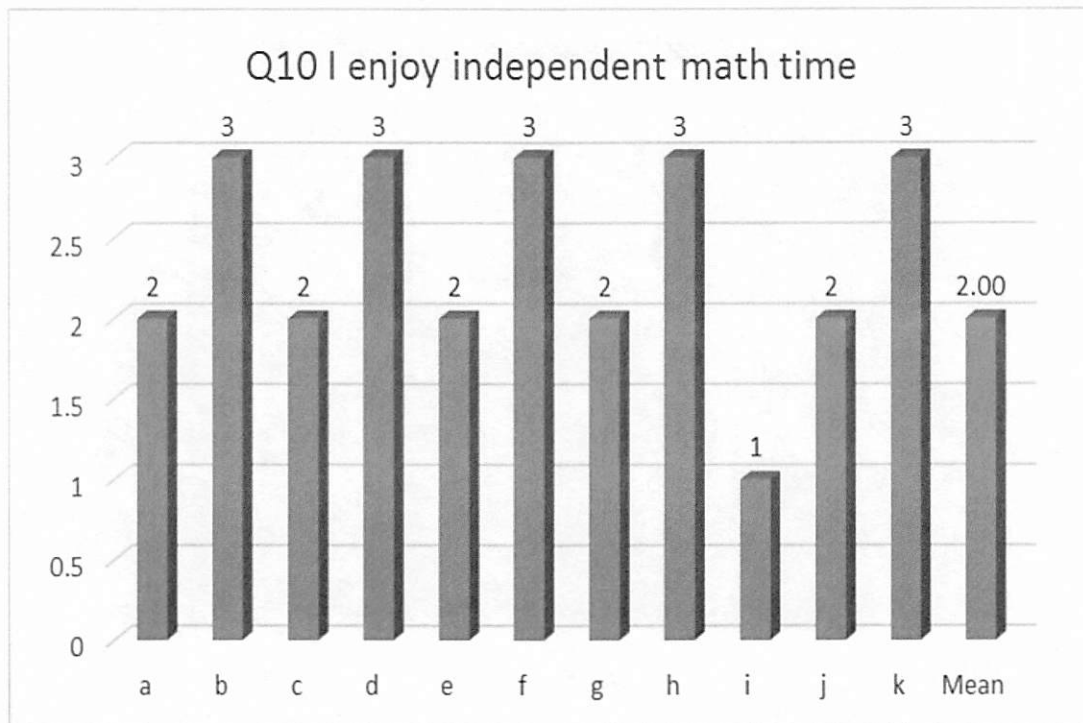


Figure 10

### Findings

With analysis of the data and the testing of the null hypothesis, a limited number of findings become apparent. The mean score was 4.55 which makes it not significant. There were several reasons why the findings were not significant.

To the statement “I do my math homework every week” five students agreed to the statement while four students somewhat agreed to the statement. There were two students who disagreed. The mean score was 1.92.

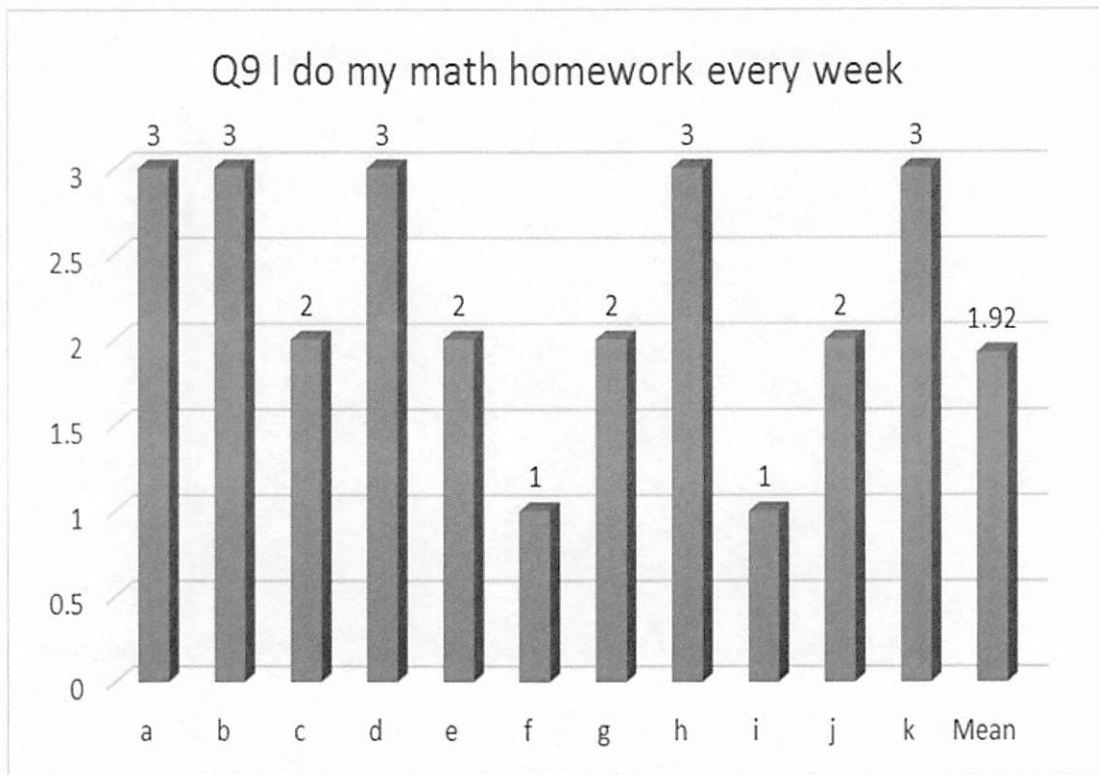


Figure 9

To the statement “I look forward to math each day” three students agreed to the statement while seven students somewhat agreed to the statement. There were one students who disagreed. The mean score was 1.85.

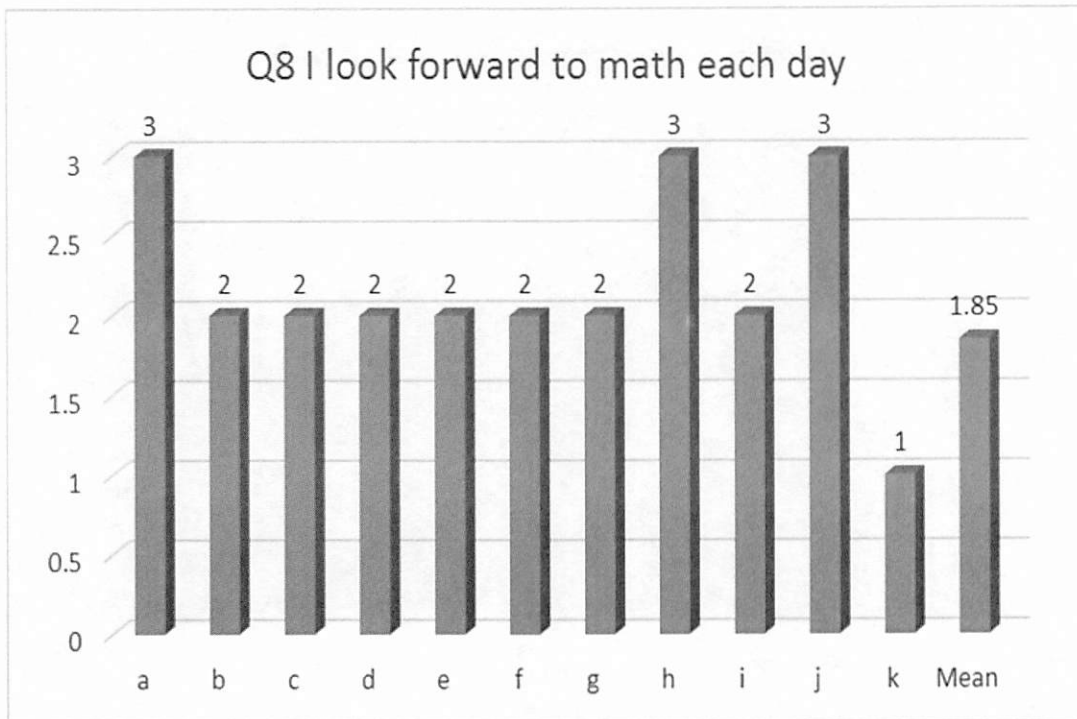


Figure 8

To the statement “I feel confident when taking a math test” four students agreed to the statement while five students somewhat agreed to the statement. There were two students who disagreed. The mean score was 1.85.

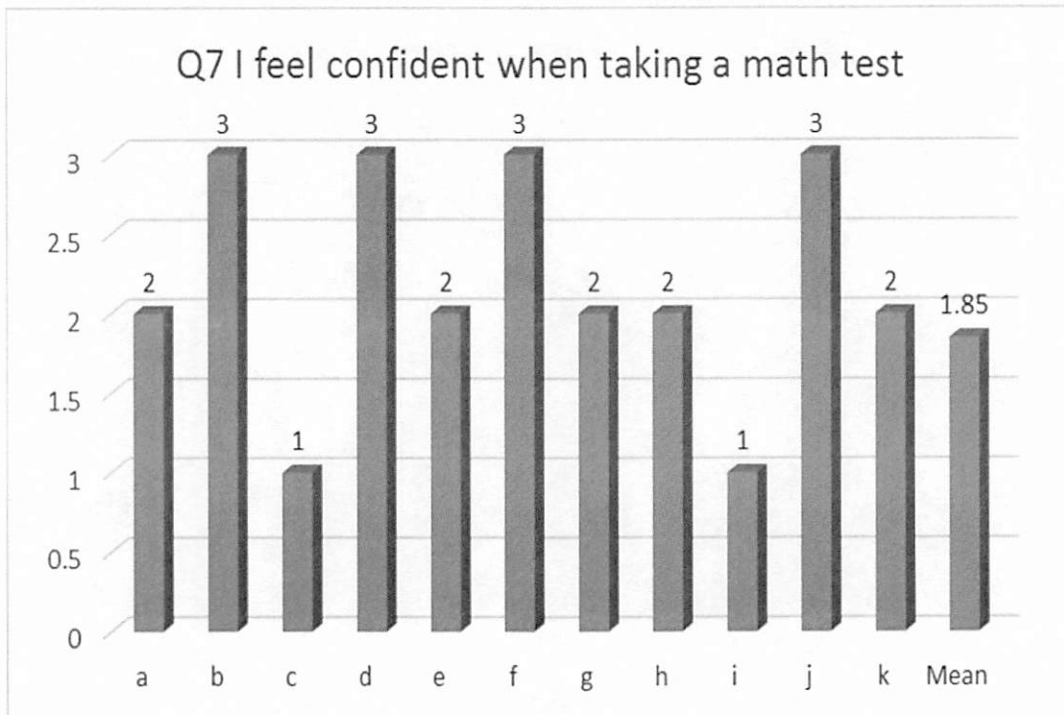


Figure 7

To the statement “I enjoy doing math with a partner” nine students agreed to the statement while one students somewhat agreed to the statement. There were one students who disagreed. The mean score was 2.31.

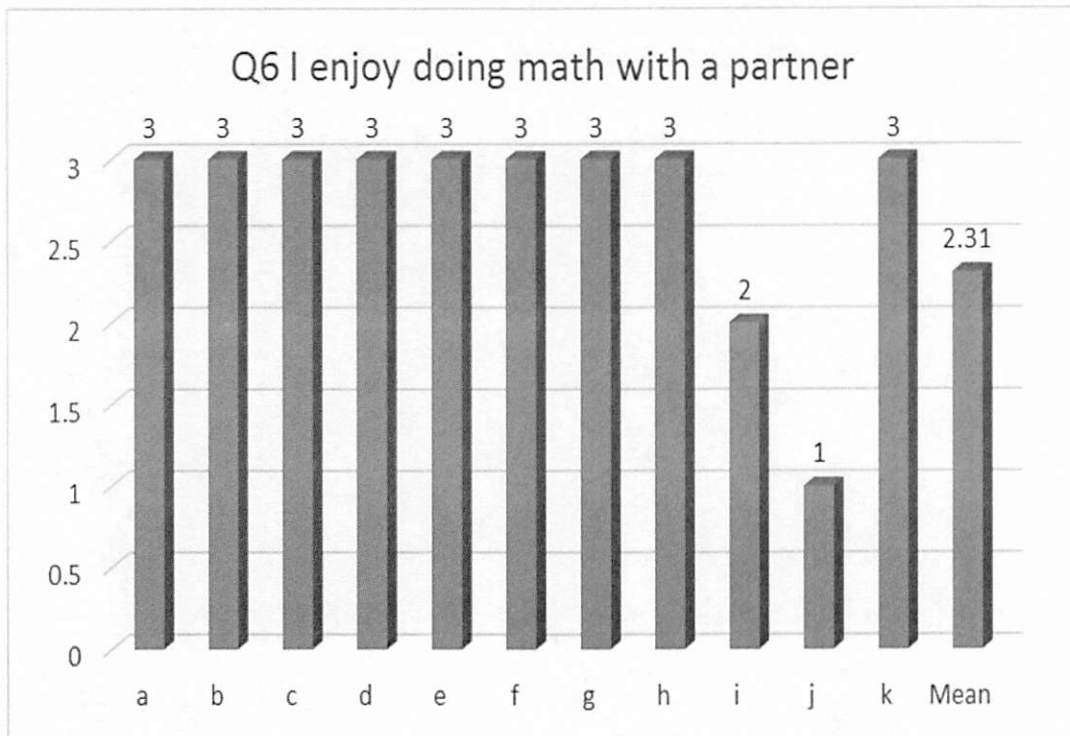


Figure 6

To the statement “I like having 2<sup>nd</sup> graders in class” five students agreed to the statement while five students somewhat agreed to the statement. There were one students who disagreed. The mean score was 2.00.

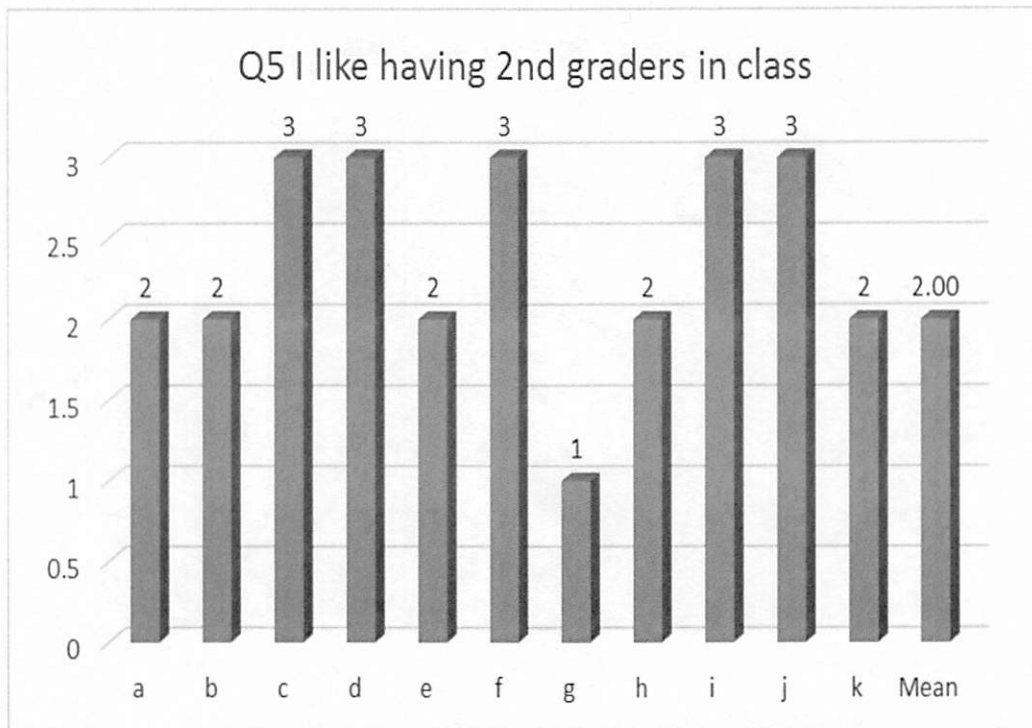


Figure 5

To the statement “I like hearing 2nd grade math while working on my iPad” seven students agreed to the statement while four students somewhat agreed to the statement. There were zero students who disagreed. The mean score was 2.23.

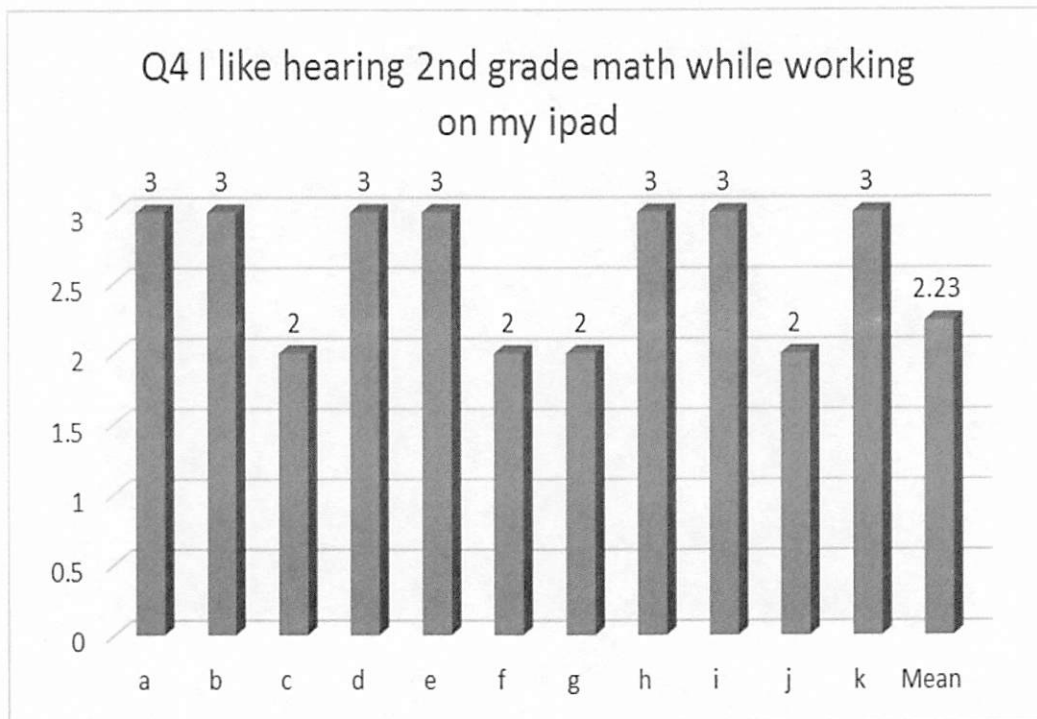


Figure 4

To the statement “I like doing math in small groups” eight students agreed to the statement while two students somewhat agreed to the statement. There were one students who disagreed. The mean score was 2.23.

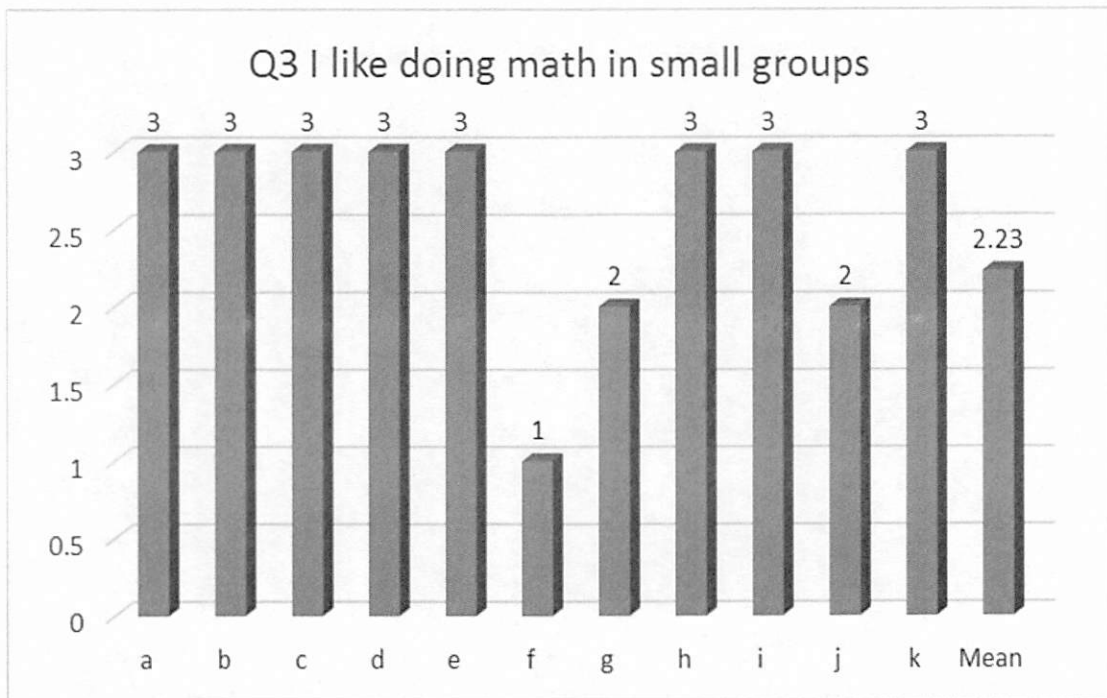


Figure 3

To the statement “Math is easy for me” six students agreed to the statement while five students somewhat agreed to the statement. There were zero students who disagreed. The mean score was 2.15.

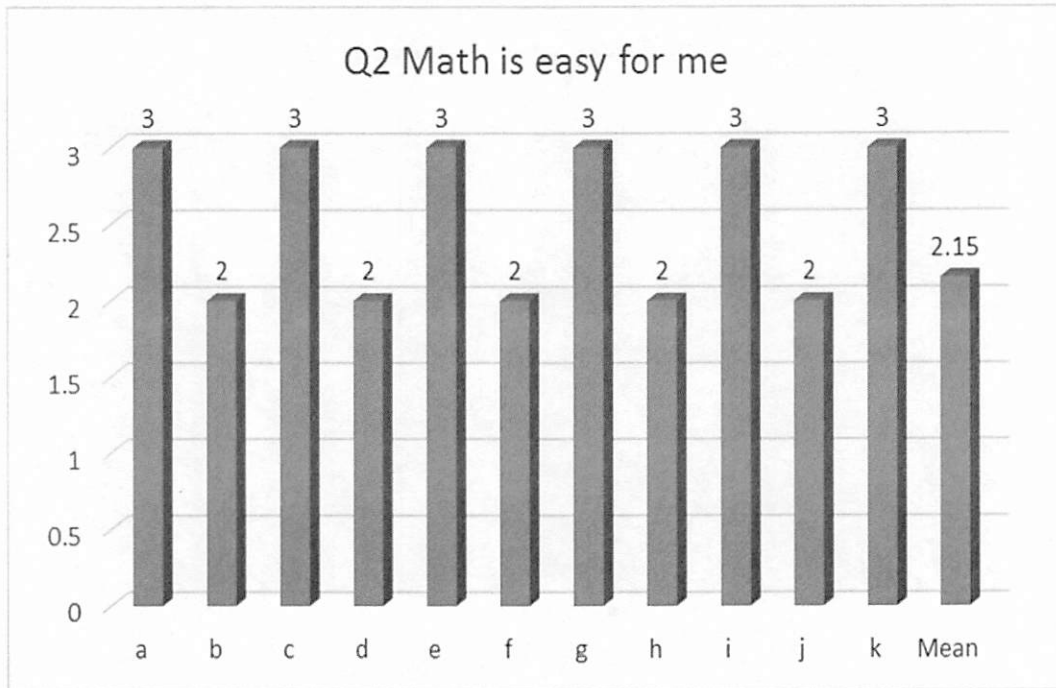


Figure 2

assessment than students who receive non-multi-age grade level instruction” was conducted. Graphs we developed to visually display the data.

To the statement “I like math” five students agreed to the statement while four students somewhat agreed to the statement. There were two students who disagreed. The mean score was 1.92.

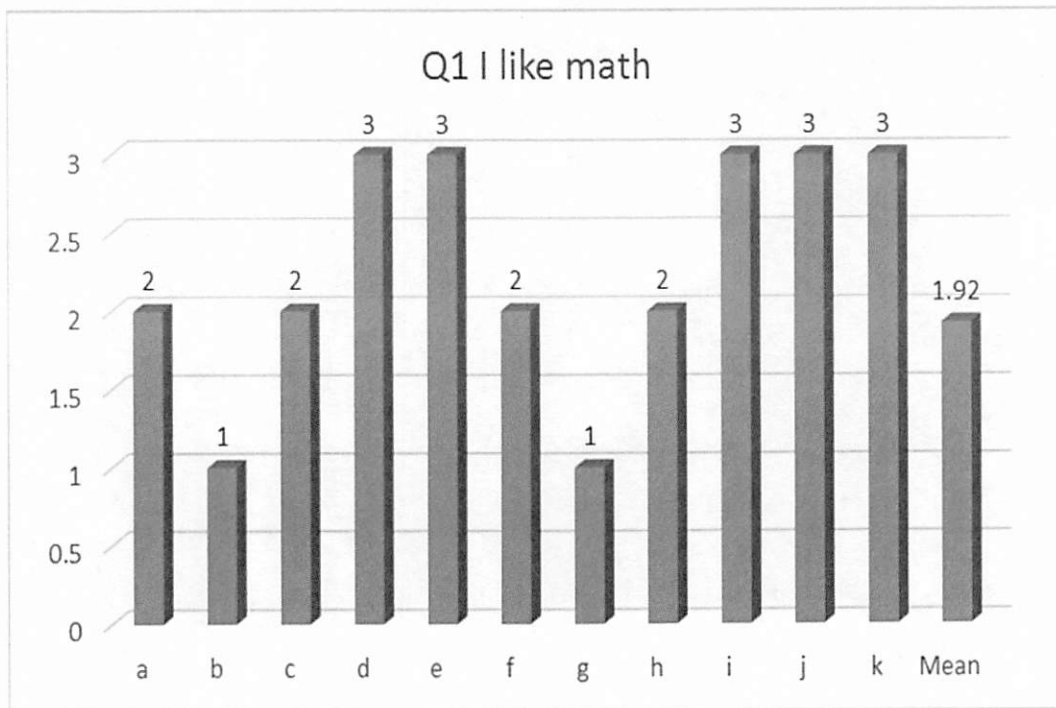


Figure 1

To show significance at  $p = .05$  a t-Value of 2.042 was required with a degrees of freedom of 33. The results of this study showed a t-Value of 1.30 with a degrees of freedom of 33. Therefore, the Independent t-Test showed that the null hypothesis could not be rejected and the hypothesis could not be supported.

The mean scores for the t-Test showed growth between the pre and post scores. This is consistent with the t-Test results. The mean score of the experimental group was 4.54 and the mean score for the control group was 3.52.



Figure A

A survey to answer the hypothesis "First grade students who receive multi-age class instruction in math will have equal to or higher scores on a chapter

multi-age grade level instruction. Students who received instruction in a multi-age class will report that they feel more confident taking the chapter assessment.

### Null Hypothesis

First grade students who receive multi-age class instruction in math will not have equal to or higher scores on a chapter assessment than students who receive non-multi-age grade level instruction. Students who received instruction in a multi-age class will not report that they feel more confident taking the chapter assessment.

### Results of the Study

Using statistical calculator program StatPak, a statistical t-Test, was performed to determine whether there was significance at the  $p = .05$  confidence level. To determine significance of the hypothesis first grade students who receive multi-age class instruction in math will have equal to or higher scores on a chapter assessment than students who receive non-multi-age grade level instruction, the researcher used an Independent t-Test.

The results of the Independent t-Test showed the number of scores for group X was 11, the mean score was 4.55, while the number of scores for group Y was 24 with a mean score of 3.38. The t-Value was 1.30 with a degrees of freedom of 33.

## CHAPTER 4

### Analysis of the Data

#### Introduction

Chapter 4 has been organized around the following topics: (a) description of environment, (b) hypothesis, (c) results of the study, (d) findings, and (e) summary.

#### Description of the Environment

This project was delimited to one first grade classroom and a multiage classroom at Hazel Valley Elementary School in the Highline School District, located in Burien, WA. The project was conducted during the 2015-2016 school year. At the end of the study there were 11 students in the experimental group, four were male and seven were female. In the controlled group there were 24 students at the end, eleven were male and thirteen were female. The test that was administered was the Math in Focus Chapter 13: Addition and Subtraction to 40 assessment.

#### Hypothesis

First grade students who receive multi-age class instruction in math will have equal to or higher scores on a chapter assessment than students who receive non-

through Microsoft Excel. The Excel program was used to find the mean and t-score of the chapter 13 pre-test and post-test. Graphs and charts were made to represent this data in Microsoft Excel. Statpak was used for a statistical analysis of the results.

Data collected from the survey was also calculated and examined using the Microsoft Excel program. Student responses were numerically presented on a scale from 1-3 corresponding to the scale of agree, somewhat agree, and disagree. The information was then represented in a chart through Microsoft Excel.

### Summary

This chapter was designed to review the methodology and treatment of data related to the study to determine if first grade students placed in a multiage first and second grade classroom would perform better on a standards based chapter test than first grade students who were not in a multiage classroom. The analysis of data and findings from this study are reported in Chapter 4.

multiage classroom for 4 weeks, 5 times a week for 60 minutes. Both teachers gave formative assessments based on common core math standards assessed on the chapter assessment throughout the 4 weeks.

Both groups were then given the same standards based chapter 13 addition and subtraction to 40 test as a post-test in April 2016. Students were also given a 10 questions survey, which was written by the researcher prior to the post-test to determine student's confidence levels and opinions relating to math. The scale used was agree, somewhat agree, and disagree.

The data from the pre and post assessments and the survey were entered into an Excel program. All results were organized and graphs were created. A statistical calculator was used to show the difference between the pre and post-tests. Answers from the surveys given were totaled and were analyzed after entered into an Excel spreadsheet. The results from the study were evaluated and conclusions drawn. The results were shared with first grade students and teachers as well as administration at Hazel Valley Elementary.

#### Treatment of Data

The data gathered from the standards based chapter 13 addition and subtraction to 40 pre-test and post-test and results were tabulated and analyzed

that the 11 students from Hazel Valley Elementary took at the end of the study.

The survey was to show student's confidence levels and opinions relating to math.

### Procedure

The researcher wanted to determine if first grade students placed in a multiage first and second grade classroom would perform better on a standards based chapter test than first grade students who were not in a multiage classroom.

Permission to conduct research at Hazel Valley Elementary was granted by Principal Casey Jeannot and a review of selected literature was also conducted at Highline Community College, Heritage University, Highline School District, and other internet search engines at the start of this study. The researcher began to gather data on both groups of students in March 2016 by giving the chapter 13 pre-test on first grade math standards. For the purpose of this study the researcher chose to focus on standards relating to addition and subtraction facts to 40.

Spreadsheets were then developed to analyze data.

For 4 weeks, 5 times a week, 40 minutes a day, after the pre-test was given, the researcher provided math instruction to students in the multiage classroom in a small group; reviewing math standards and content students missed and needed to understand from the pre-test. Congruently with the researcher's work, another certificated teacher gave only whole group instruction to students not in a

disagree. This 10 question survey was given to students in the experimental group at the end of the study.

The Math in Focus chapter 13 test was a curriculum created instrument therefore it should have had limited validity and reliability issues. The researcher utilized spreadsheet data collection to insure accuracy. Statpak was recognized as a statistical calculator limiting the validity and reliability issues. The researcher tried to control the setting of the survey to control validity issues.

### Design

Within each method in the research studied, there were a variety of designs. In an experimental study the researcher used a pre-test and a post-test. The designed used data from the Math in Focus pre-test and post-test in math. The purpose of this was to determine if first grade students who receive multi-age class instruction in math will have equal to or higher scores on a chapter assessment than students who receive non-multi-age grade level instruction. Students who received instruction in a multi-age class will report that they feel more confident taking the chapter assessment. The 35 students who participated in this study were not chosen at random. The researcher used a quasi-experimental design because the participated group was chosen at random. The researcher prepared a survey

11 students in the experimental group and 6 of those students were classified as English Language Learners. Hazel Valley Elementary had an enrollment of 666 students in the spring of 2015. The ethnicity of Hazel Valley Elementary was 53.1% Hispanic, 1.1 % American Indian/ Alaskan Native, 13.9% Asian, 8.0% Black/African American, 3.2% Native Hawaiian/ Other Pacific Islander, 14.2% White, and 6.3% two or more races. Free and reduced was 80.3%. Special Education was 12.8%. Transitional Bilingual was 43.5%. There were 36 classroom teachers, of which 63.9% had their master's degree; however, 100% of teachers were highly qualified. (Office of Superintendent of Public Instruction 2014)

### Instruments

The data gathering devices that were used were a Math in Focus pre and post-test to collect data, a survey, and an excel spreadsheet that the researcher entered data gathered into. Excel was also used to create graphs and charts to illustrate the data. Statpak was the statistical calculator use to determine significance of the data results. A survey was designed to determine student's confidence levels and opinions relating to math. The scale used was agree, somewhat agree, and

an assignment of an entire classroom instead of assigned individual students. It has less control of variable.

In a True-Experimental design the research involves participants who were randomly selected and assigned to a treatment and controlled group. The external variable was also controlled. The researcher used the Quasi-Experimental design because it best meets the research. The collected data was entered into a statistical calculator (Statpak) and a t-test. The results of the t-test were then compared to distribution of t table to ascertain if the treatment did provide a significant change in lesson delivery.

### Participants

This project was delimited to two first grade classrooms at Hazel Valley Elementary: one a multi-age classroom with both first and second graders and one a class only of first graders. This project was conducted in the winter of the 2015-2016 school year, with 35 students at the start of the study. There were 15 boys and 20 girls. At the start of the study there were 11 students in the experimental group. 6 of those students are classified as English Language Learners. At the end of the study, there were 35 students: 15 boys and 20 girls. The study ended with

## CHAPTER 3

### Methodology and Treatment of the Data

#### Introduction

This chapter has been organized around the following topics: (a) Methodology, (b) Participants, (c) Instruments, (d) Design, (e) Procedure, (f) Treatment of the Data, (g) Summary.

#### Methodology

The researcher determined that the best method for this study was the Quasi-Experimental design. Based on action research, the study was conducted in Buriem at Hazel Valley Elementary to determine if first grade students placed in a multiage first and second grade classroom would perform better on a standards based chapter test than first grade students who were not in a multiage classroom. Permission to conduct this study was granted by Principal Casey Jeannot at Hazel Valley Elementary. The chapter 13 Addition and Subtraction to 40 pre-test was given March 2016 and the post-test was given April 2016.

Quasi-Experimental design according to Gay (2003) in *Educational Research: Competencies for Analysis and Application* consists of the specific components. Action research was where the researcher was involved in this study and was in an education setting. Quasi-Experimental Research is research that is conducted with

Multiple varieties of assessments are used to assess students' achievement. One of the assessments was Smarter Balance or SBAC, it was created from the Common Core. Another online assessment used was Measures of Academic Progress (MAP). MAP creates a personalized assessment experience by adapting to each student's learning level. It measured students' progress and growth for each individual. <https://www.nwea.org/assessments/map/>

### Summary

The focus of this chapter was to address the available evidence to the topics of (a) Educational Laws, (b) Best Practices, (c) Multiage Class Research vs. Whole Class Research, (d) Assessments. The methodology and treatment of the data are reported in Chapter 3.

new ideas and integration of new practices.

(<http://www.benchmarkeducation.com/best-practices-library/how-to-effectively-observe-best-practices.html>).

It did need to be remembered also that best practices in education were always getting better. Somewhere, someone has done something different and have gotten a different result that is better. A best practice is not always considered the 'best practice' because it is constantly being improved. The best teaching, just like the best science and the best medicine, is a moving target and we as teachers need to constantly be looking for that new best practice.

([http://www.ttms.org/best\\_practice/best\\_practice.htm](http://www.ttms.org/best_practice/best_practice.htm)).

### Multiage Class Research vs. Whole Class Research

A great portion of American history includes multiage education because of one-room school houses throughout the nation. It wasn't until the mid-nineteenth century that the curriculum-centered approach appeared; this was due to an increase in immigration and an economy that was developing at a rapid speed. During this same time period, innovators began to develop child-centered education that had a focus on applying developmentally appropriate techniques in

-- this makes for a smooth and speedy transition with little to no downtime;  
Design the end goals and end product first (also known as backward planning);  
Share models with students of the product or outcome you want them to create or design -- and also continually model in your own behavior how you want them to act and treat each other; Don't throw anything away, especially in your first few years of teaching; you might need it later.”

(<http://www.edutopia.org/blog/defining-best-practice-teaching-rebecca-alber>)

The term best practice was originally borrowed from the professions of law, medicine, and architecture, where ‘good practice’ or ‘best practice’ were everyday phrases used to describe solid, reputable, state-of-the art work in a field. Until recently, we haven’t had an everyday term for state-of-the-art work in education and some people insist that education as a field does not enjoy the clear-cut evolution as do other professions.”

(<http://www.heinemann.com/shared/onlineresources/e00744/sample.pdf><http://www.ncpublicschools.org/docs/curriculum/bpractices2.pdf>).

Knowledge of instructional practices in education can help with the basic nuts and bolts of everyday teaching. It can present educators with ideas for organization, development of classroom management, lesson plan development, and even resources for specific needs of students All the while leaving time for

administered to an ELL in English is unlikely to render a true portrait of what the student knows and is able to do because language impacts the result. Researchers argued that because of this, it is not valid to give an ELL and academic content test and use the results on a school's evaluation. They also believed that these tests should not be used to determine high school graduation, grade promotion, or program placement. Kate Menken also notes that, "This achievement gap does not mean that ELLs are failing to acquire English or learn course content; rather, it more likely simply affirms that the students are indeed ELLs, and that language is posing a barrier reflected in their test performance." (Menken, 2011. Pg. 123).

### Best Practices

In the teaching world, what is often said is, "Why reinvent the wheel when there are plenty of practices that already work?" Best practices in education can be defined as existing practices that have a high level of widely-agreed effectiveness. In other words, these programs work and they get results.

Edutopia.com noted that a few straightforward best practices known and used, by many educators are "Check for understanding often and in a variety of ways; If you don't have a well-thought out plan for your students, they will have one for you; Set up the next activity while students are completing the current one

being in place. Based on rules regarding Adequate Yearly Progress, many schools failed to meet their set rates of improvement. Thirty-eight percent of schools in 2010 were considered failing. This was up from 29 percent in 2006.

<http://www.edweek.org/ew/issues/no-child-left-behind/index.html>. (Education Week, 2011) Since these schools continued to fail, federal funding was reduced and these schools lacked support to turn around and be successful.

In the No Child Left Behind act, the law also required the inclusion in its assessments of English Language Learners (ELLs). These students must make annual progress in English Language Proficiency as well as academic content on standardized tests. However, because standardized tests were administered in English, this posed a problem and greatly impacted the performance of ELLs. Kate Menken (2010) states in her article *NCLB and English Language Learners: Challenges and Consequences* that “ELLs have yet to reap the benefits of this educational reform; instead, the quality of schooling for ELLs may indeed have worsened, rather than improved, during the NCLB era.” NCLB terminated the Bilingual Education Act and replaced it with other acts (Title III, Academic Achievement Act, English Language Acquisition, etc.) where these acts put a strong emphasis on English Learning and required students to take and pass statewide assessments. Testing research has shown that a content-area test

No Child Left Behind was an educational reform set in place to hold states and schools more accountable for student progress and success. This meant annual testing for students that were aligned to state academic standards; schools had to meet Annual Yearly Progress, where it was required that states bring all students up to a “proficient level”; and it require all teachers to be considered Highly-Qualified in each subject that they taught. Funding also changed with NCLB as well. Title 1 funding was to be provided to schools with a high population of poor children. <http://www.edweek.org/ew/issues/no-child-left-behind/index.html>.

The philosophies of the NCLB act was to reward success and sanction failure in our education system. It wanted to close the ever wide achievement gap between rich and poor. It also recognized that billions of dollars were being bumped into an educational system that was not meeting goals toward nation-wide educational success. The government wanted to instead spend federal dollars on best research programs and practices. In George W. Bush’s *No Child Left Behind* blueprint he states that, “In America, no child should be left behind. Every child should be educated to his or her potential,” (Bush, 2001, pg 8) and he pushed to make this vision a reality.

Though recent reports after the act had been put into place suggested immense growth and success, concerns began to arise however after a few years of the act

## CHAPTER 2

### Review of Selected Literature

#### Introduction

This chapter has been organized around the following topics: (a) Educational Laws, (b) Best Practices, (c) Multiage Class Research vs. Whole Class Research, (d) Assessments, and (e) summary.

#### Educational Laws

President Lyndon B. Johnson signed the Elementary and Secondary Education Act (ESEA) into law in 1965. The act offered grants to districts serving low-income students, scholarships for colleges of low-income, and it created centers for special education. This law was put into place to improve the quality of elementary and secondary education in the United States. In 2001 however, President George W. Bush reauthorized this act and renamed it: No Child Left Behind (NCLB). The purpose of reauthorization according to the act was to “ensure that all child have a fair, equal, and significant opportunity to obtain a high-quality education and reach at a minimum, proficiency on challenging state academic achievement standards and state academic assessments.” (Public Law 07-110 107<sup>th</sup> Congress an Act, 2002. Pg.15)

T-test. Assesses whether the means of two groups are statistically different from each other

Quasi-Experimental Research. An experimental design in which research participants are not selected at random.

Microsoft Excel. A spreadsheet developed by Microsoft featuring graphing tools, calculations, and tables.

Acronym

AYP – Annual Yearly Progress.

ELL – English Language Learner.

GLAD – Guided Language Acquisition Design

ME – Multicultural Education.

NCLB – No Child Left Behind

ESEA – Elementary and Secondary Education Act

OSPI – Office of Superintendent of Public Instruction.

15. A conclusion was drawn regarding math instruction in a multiage classroom verses a non-multi-age classroom.

### Definition of Terms

For the purpose of this study, the following words are defined:

Math Standards/ Standards based. Content students should be able to understand and be able to do in mathematics.

Whole Group Instruction. A lesson taught to an entire class at once.

Multi-Age Classroom. A classroom with students of more than one grade level.

Chapter Assessment. A test given at the end of a unit to assess student skills and understanding.

Small Group instruction. Lessons taught to a small group of students usually containing 2-6 students.

Framework. A guide to teaching a math chapter or unit.

Pre-Test. A test given to students before they have been taught

Post Test. A test given to students after they have learned a specific content area.

Formative Assessment. An assessment given throughout the unit to check for student understanding or error.

Statpak. Statistical analysis calculator

4. Based on pre-test scores, students in a multiage classroom were given daily problems reviewing standards and content they missed as well as instruction in a smaller group (Groups of 11) while all other students were given whole group math instruction in a larger group (Group of 28).
5. The teacher made formative assessments based on common core math standards assessed on the chapter assessment.
6. All students were given the same math problems directly related to the daily math lesson.
7. After 4 weeks of instruction, students were given the chapter 13 post test.
8. A 10 questions survey was written by the teacher (See Appendix B)
9. After the math chapter 13 assessment, all students were given a survey to see how they felt about math.
10. Spreadsheets were developed in Microsoft Excel to analyze data.
11. Statistical analysis was run using StatPak.
12. The math post-test was graded, entered into an Excel spreadsheet and shared with students, staff, and administrators. (See table 1 and 2)
13. Surveys were totaled and shared with staff and administration.
14. Scores were compared between the multiage classroom and a non-multi-age classroom. (See figures 1-4)

### Significance of the Project

The purpose of this project was to provide a factual base of information regarding multiage level class configuration in relation to math achievement on a chapter assessment. Students who received instruction in a multiage classroom had equal to significantly higher scores on the chapter 13: Addition and Subtraction to 40 test than students who received whole group instruction in math. Teachers reported their preference in small group and whole group instruction in math. Positive results would have concluded that instruction in a multiage classroom was more beneficial than whole group instruction. If results do not turn out as expected, it would mean that there were no benefits to instruction in a multiage classroom.

### Procedure

1. Permission to conduct research at Hazel Valley Elementary School was granted by Principal Casey Jeannot (See Appendix A)
2. A review of selected literature was conducted at Highline Community College, Heritage University, Highline School District, and internet search engines.
3. All first grade students were given the chapter 13 math assessment pre-test.

### Assumptions

For this study it was assumed that students stayed focused, paid attention and did their best work during math instruction. Students also tried their best on their math chapter assessment and were on time and attended school daily. Another assumption was that on survey questions, students were honest in their answers.

### Hypothesis

First grade students who receive multiage class instruction in math will have equal to or higher scores on a chapter assessment than students who receive non-multiage grade level instruction. Students who received instruction in a multiage class will report that they feel more confident taking the chapter assessment.

### Null Hypothesis

First grade students who receive multi-age class instruction in math will not have equal to or higher scores on a chapter assessment than students who receive non-multi-age grade level instruction. Students who received instruction in a multi-age class will not report that they feel more confident taking the chapter assessment.

were six students that were ELL. In the start of the study in the controlled group there were 24 students, eleven were male and thirteen were female. In this group 12 were ELL. At the end of the study there were 11 students in the experimental group, four were male and seven were female. In that group of students there were six students that were ELL. In the controlled group there were 24 students at the end of the study, eleven were male and thirteen were female. In that group there were twelve students that were ELL. Hazel Valley Elementary had an enrollment of 666 students in the spring of 2015. The ethnicity of Hazel Valley Elementary was 53.1% Hispanic, 1.1 % American Indian/ Alaskan Native, 13.9% Asian, 8.0% Black/African American, 3.2% Native Hawaiian/ Other Pacific Islander, 14.2% White, and 6.3% two or more races. Free and reduced was 80.3%. Special Education was 12.8%. Transitional Bilingual was 43.5%. There were 36 classroom teachers, of which 63.9% had their master's degree; however, 100% of teachers were highly qualified. (Office of Superintendent of Public Instruction 2014)

### Statement of the Problem

Based on funding and numbers of student enrollment at Hazel Valley Elementary School, it was determined that a multi-age classroom of 1<sup>st</sup> and 2<sup>nd</sup> grade students would be created to solve this problem. After evaluation, the teacher determined that through instruction in a multi-age classroom, students would perform better on a math chapter test than students who were in a whole group, single grade level class.

### Purpose of the Project

The purpose of this study was to determine if first grade students who received multiage class instruction in math had equal to or higher scores on a math chapter test than students who received non-multiage instruction. In addition, students involved in instruction in a multiage class would report that they felt more confident taking the math chapter test.

### Delimitations

This project was delimited to two first grade classrooms at Hazel Valley Elementary: one a multi-age classroom with both first and second graders and one a class only of first graders. This project was conducted during the 2015-2016 school year. At the start of the study there were 11 students in the experimental group, four were male and seven were female. In that group of students, there

implemented around the country. However, with this wide range it was difficult for researchers to generalize the academic impact of multiage education (Lloyd, 1999).” There are advantages of multiage classrooms which included a diverse grouping of students learning together, an enhanced social and emotion setting, and higher language development. It has been also said that multiage classrooms help older students serve as role models or mentors to their younger peers and disobedience is less prevalent.

Teachers have used different types of assessments that included formative, informal, and summative assessments. Formative assessment were judgements about students work frequently during the flow of instruction and summative assessment focuses on evaluating the work some point after instruction.

<http://web.b.ebscohost.com.libdb.heritage.edu/ehost/pdfviewer/pdfviewer?sid=311da0fa-2ec3-4c83-a80c-e2cfff1d1d0d%40sessionmgr102&vid=1&hid=123>. Some examples of formative assessments were exit tickets and worksheets. Some examples of summative assessment were end-of-unit or chapter tests, state assessments, and district benchmark or interim assessments. These assessments were valuable because they inform teacher’s classroom instruction and hold school accountable for student learning.

W. Bush Jr. in 2001. The purpose was to “ensure that all child have a fair, equal, and significant opportunity to obtain a high-quality education and reach at a minimum, proficiency on challenging state academic achievement standards and state academic assessments.” (Public Law 07-110 107<sup>th</sup> Congress an Act, 2002. Pg.15). As a result of the No Child Left Behind Act passed by George W. Bush in 2001, many schools were deemed failing because of the required expectations to meet Annual Yearly Progress which was assessed through state assessments. This led to several more problems in the field of education.

Best practices in education can be defined as existing practices that have a high level of widely-agreed effectiveness. These were programs that work and they get results. A few best practices included checking for understanding in a variety of ways; Design the end goals and end product first; Share models with students of the product or outcome you want them to create or design, etc.

(<http://www.edutopia.org/blog/defining-best-practice-teaching-rebecca-alber>).

Knowledge of instructional practices have helped teachers in areas of organization, development, classroom management, and development of lesson plans.

The creation of multiage classrooms can be dated way back in American history. Now there are wide range of ways multiage groupings that are being

## CHAPTER 1

### Introduction

#### Background for the Project

Based on poor state funding, laws that impact class size, and the amount of English Language Learners enrolled, Hazel Valley Elementary in the Highline School District was a school who was overloaded with first and second grade students and because of this a multiage classroom was created to solve this problem. Eleven first grade students and thirteen second grade students, ranging in ability were placed in a classroom together. As a result, the teacher was able to in math implement, small group instruction and first grade students were also able to be present during the time of second grade math instruction. This study helped determine if first grade students who received instruction in a multiage classroom in math had equal to significantly higher scores on a chapter math test than first students who received whole group instruction in math.

There were many different educational laws that were created that had a major impact on quality of education, teacher accountability and student learning. Such laws included the Elementary and Secondary Act signed in 1965 by President Lyndon B. Johnson and the No Child Left Behind Act signed by President George

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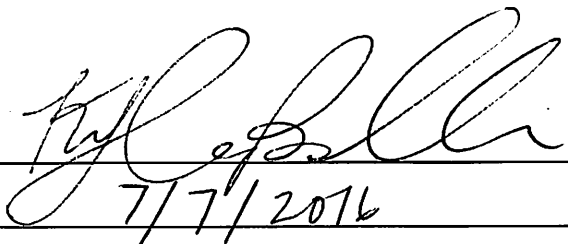
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PERMISSION TO STORE

I, Kylene Boddie, hereby irrevocably consent and authorize Heritage University Library to file the attached Special Project entitled, *Better Success in Multi-Age Classrooms*, and make such Project and Compact Disk (CD) available for the use, circulation and/or reproduction by the Library. The Project and CD may be used at Heritage University Library and all site locations.

I state at this time the contents of this Project are my work and completely original unless properly attributed and/or used with permission.

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7/7/2016  
\_\_\_\_\_, Date

## ABSTRACT

### Better Success in Multi-Age Classrooms

Researcher: Kylene Boddie, B.A. in Ed., Sociology, WWU

M.Ed., Heritage University

Chair Advisory Committee: Robert P. Kraig, PhD.

The purpose of this study was to determine if first grade students who received multiage class instruction in math had equal to or higher scores on a math chapter test than students who received non-multiage instruction. In addition, students involved in instruction in a multiage class would report that they felt more confident taking the math chapter test. An experimental and control group were given the same pre and post standards based chapter 13 addition and subtraction to 40 test in March 2016 and April 2016. Students were also given a 10 questions survey. The results of this study showed a t-Value of 1.30 with a degrees of freedom of 33. Therefore, the Independent t-Test showed that the null hypothesis could not be rejected and the hypothesis could not be supported.

FACULTY APPROVAL

Better Success in Multi-Age Classrooms

A Master's Special Project

by

Kylen Boddie

Approved for the Faculty

Robert P. Kraig, Faculty Advisor

Dr. Robert P. Kraig

7/8/2016, Date

**Better Success in Multi-Age Classrooms**

---

**A Special Project**

**Presented to**

**Dr. Robert P. Kraig**

**Heritage University**

---

**In Partial Fulfillment**

**of the Requirements for the Degree of**

**Masters in Teacher Leadership with a Specialization in English as a Second**

**Language**

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**Kylen Boddie**

**6/30/2016**

valuable and important, it cannot be used to fully evaluate all aspects of the learning process.

<https://www.amle.org/BrowsebyTopic/WhatsNew/WNDet/TabId/270/ArtMID/888/ArticleID/286/Formative-and-Summative-Assessments-in-the-Classroom.aspx>

Another topic to address is the criticisms that state assessments have received by teachers. Often teachers don't receive test results soon enough to allow them to adapt their instruction to meet the needs of their students. As noted by Kathy Christie, a number of states are working to correct these problems. A few states are beginning to improve their capacity to assess students via computers (Christie).

<http://web.b.ebscohost.com/libdb.heritage.edu/ehost/pdfviewer/pdfviewer?sid=9ae1d3a7-ed3c-4e42-98d1-950f537592da%40sessionmgr198&vid=1&hid=123>

Our world has relied so much on technology that schools have used technology to assess students. As stated in the article Evidence of Learning Online: Assessment Beyond the Paper Boettcher says, "Using technology can be more stimulating and gives learners more choices to enable them to tap into their creativity and their enjoyment in learning and sharing."

<https://campustechnology.com/Articles/2011/02/23/Assessment-Beyond-The-Paper.aspx?Page=2>

parents, lack of teacher preparation and intensive workload, and policy constraints.

### Assessments

Teachers have used different types of assessments that included formative, informal, and summative assessments. As stated in the article “Formative Assessment: Simply, No Additives”, it defines formative assessment as “the appraisal of student’s performance. Forming a judgement about students work frequently in the flow of instruction. Summative assessment focuses on evaluating the work some point after instruction. Formative assessment is a gap-minder because it helps the teacher to see which individuals need more help or if adjustments to instruction needs to happen.”

<http://web.b.ebscohost.com.libdb.heritage.edu/ehost/pdfviewer/pdfviewer?sid=311da0fa-2ec3-4c83-a80c-e2cff1d1d0d%40sessionmgr102&vid=1&hid=123>

Examples of summative assessments are: end-of-unit or chapter tests, state assessments, district benchmark or interim assessments, semester exams or end of term exams, and scores that are used to hold schools and students accountable. Those are referred to as Annual Yearly Progress assessments and student report card grades. Although the information gathered from summative assessment is

hopes that students be more successful. All of these efforts have led to current systems of multiage education. (Song, 2009)

Song, Spradlin, and Plucker in their article *The Advantages and Disadvantages of Multiage Classrooms in the Era of NCLB Accountability* state that, “The current point of contention is whether multiage groupings help increase children’s academic skills, and so far, the results of the few available studies are inconsistent. Slaton (1997) suggests that the forced assignments for both teachers and students in multiage classrooms might contribute to negative academic outcomes in some situations (Slaton et al., 1997), while Veeman (1995) attributes the prevailing confusion about multiage education to the inconsistent definition of multiage education. According to Lloyd (1999), the wide range of ways multiage groupings are implemented makes it difficult for researchers to generalize the academic impact of multiage education (Lloyd, 1999).”

Advantages of multiage classrooms have included a diverse yet balanced grouping of students, an enhanced social and emotion setting, and higher language development. It has been also said that multiage classrooms help older students serve as role models or mentors to their younger peers and disobedience is less prevalent. Disadvantages of a multiage classroom included difficulties implementing and operating such a program, rejection and dissatisfaction from