

An Experimental Study: Improving First Grade Nonsense  
word Fluency with Starfall Computer Intervention

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A Special Project

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## ABSTRACT

The purpose of this experimental study was to determine whether *Starfall* Computer Intervention at the elementary school level improved *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) assessments scores of the first grade students at Harrah Elementary School. To accomplish this purpose, a review of selected literature was conducted, baseline data were obtained and analyzed, and related conclusions and recommendations were formulated. Data analysis indicated that *Starfall* computer intervention did not have a significant impact on the DIBELS NWF assessment.

## CHAPTER 1

### Introduction

#### Background for the Project

The educators at Harrah Elementary School (HES) felt strongly that first grade students who were struggling readers needed to have effective interventions. Intensive (Tier III) and strategic (Tier II) students were not provided with any resources to help them use decoding and fluency skills for reading comprehension mostly due to the lack of time. Although small modifications to the interventions were made, the teachers still lacked the time and resources to effectively give the students the individual instruction and materials they needed to make adequate progress in reading, as shown by their *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) assessments.

Harrah Elementary School educators were concerned about the number of first grade children who struggled with reading and realized that if students experienced a lack of success in reading had more difficulty meeting the benchmark standard. Educators noted that student success in reading comprehension was influenced by the student's

willingness and drive for improvement. The lack of motivation for some students hindered their ability to reach their fluency goal. "Struggling readers encounter negative consequences: grade retention, assignment to special education classrooms, or participation in long-term remedial services" (Stahl, Heubach, & Holcomb, 2005, p. 30).

The researcher hypothesized that providing additional reading instruction with the use of a free computer program, *Starfall*, which focused on student weakness in decoding, automaticity and fluency, assisted educators in meeting the need for struggling readers.

#### Statement of Problem

Harrah Elementary teachers were concerned about the numbers of first grade Tier III and Tier II students who were not making sufficient gains in their Nonsense Word Fluency (NWF) assessment from the Dynamic Indicators of Basic Early Literacy Skills screen (DIBELS). The low score, reflected low phonics skills which hindered decoding text, reading accuracy, comprehension, reading speed, and their skill at becoming fluent readers. Therefore, HES needed to change their intervention program in order to

adequately accommodate the needs of all students who struggled with NWF.

### Purpose of the Project

The purpose of this project was to determine whether the *Starfall* computer program would be an effective intervention for students who struggled with decoding and reading fluency. The additional time spent on decoding, automaticity, and fluency would help engage and motivate students to improve decoding skills.

### Delimitations

There were 500 students attending Harrah Elementary School, 98 of which were in the first grade. The population consisted of 85% Native American, 10% Hispanic, and 5% Caucasian. The researcher tested two first grade classrooms where the student's ages ranged from six to seven years old. There were 40 students enrolled in the study in which 29 of those students were Native American and the other eleven students were Hispanic. Three students had an Individual Educational Plan for speech and language disabilities.

Most of the Native American students lived on the Yakama Nation Reservation where the elementary school was

located. The area was low-income with 84.1% of the students receiving free or reduced lunch. There was very little parent involvement, and Harrah Elementary School was the only elementary school in the district of White Swan.

The first grade students were given the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) screening assessment at the beginning, middle, and end of the 2006-2007 school years. The students were individually screened by their homeroom teachers and given instructions on the process of the assessment.

Each student was timed for one minute on Phonological Awareness, Nonsense Word Fluency, and alphabet recognition. After completion of the DIBELS screen, each student was identified as Intensive (Tier III), Strategic (Tier II), or at Benchmark standard.

#### Assumptions

The researcher believed that the teachers at HES were provided with 90 minutes of reading instruction and had fidelity to the *Open Court Reading* program. The assumption was that teachers administered the DIBELS test three times a year and provided individual support for Tier III and Tier II students through progress monitoring, decoding, automaticity, and fluency.

The researcher also believed that the teachers were communicating with the parents on the students' progress and together worked out a planned intervention for additional practice at home with parent support, feedback, and materials provided by the teacher. The premise was that a developed foundation in word recognition would build a bridge between fluency and reading comprehension. Students who were fluent readers would become more motivated, engaged, and more likely to earn a high school diploma.

#### Hypothesis

Students provided with *Starfall* computer intervention focused on decoding, automaticity and fluency will make significant gains on the Dynamic Indicators of Basic Early Literacy Skills Nonsense Word Fluency screening assessment post-test. This focused goal was vital for struggling students to become fluent readers.

#### Null Hypothesis

There was no significant difference between students provided with *Starfall* computer intervention focused on decoding, automaticity and fluency and the Dynamic Indicators of Basic Early Literacy Skills screening

assessment post-test. The significance was determined by  $p \geq .05$ , .01, and .001.

### Significance of the Project

This study was needed at HES due to the lack of success of many of the Tier III and Tier II students on their NWF assessment. Teachers had little time to provide quality interventions made evident by the high number of student not making adequate progress on their DIBELS NWF assessment.

### Procedure

The researcher worked with each strategic student on intensive activities such as DIBELS Progress Monitoring, Read Naturally, and shared reading. With each individual session, the researcher used motivation techniques that enhanced student awareness of fluency production and improvement on cueing the student to read faster. The objective was to encourage the students and eliminate decoding and focus more on fluency and accuracy of the text.

The data was taken from 40 students who were identified as strategic on the DIBELS screening assessment, NWF probe. The pre-test was administered in September of



2006 prior to any interventions and the post-test in May of 2007 after nine months of individual interventions with the *Starfall* Computer Program. Strategic students were given 20 minutes of computer access and the teacher provided additional progress monitoring to track student progress through the duration of this study.

#### Definition of Terms

Dynamic Indicators of Basic Early Literacy Skills. The DIBELS assessment was defined as a standardized screen that measures early literacy development that monitors the development of pre-reading skills focusing on phonological awareness, alphabetic understanding, and automaticity and fluency (Kaminski & Good, 1996).

Nonsense Word Fluency. The DIBELS Nonsense Word Fluency (NWF) measure was defined as a standardized, individually administered one minute test that measures reading speed and accuracy.

Fluency. Fluency was defined as the effortless reading of words. Fluent readers grouped words into meaningful phrases and used expression and involved reading speed and accuracy of word identification.

Annual Yearly Progress. Annual yearly progress was defined as the progress that each school made on an annual basis.

Acronyms

DIBELS. Dynamic Indicators of Basic Early Literacy Skills

NWF. Nonsense Word Fluency

NCLB. No Child Left Behind

OSPI. Office of Public Instruction

HES. Harrah Elementary School

WASL. Washington Assessment of Student Learning

## CHAPTER 2

### Review of Selected Literature

#### Introduction

Educators at HES were concerned about the numbers of first grade Tier III and Tier II students who were not making sufficient gains on their NWF assessment from the DIBELS. Educators established a reading community in their classrooms where all students could participate in a literacy enriched environment with appropriate interventions that encouraged their students to make connections to what they read by explicit instruction and assessment that focused on fluency, automaticity, and comprehension.

#### No Child Left Behind

In first grade there were many different content objectives that needed to be mastered for students to meet the academic standards which were mandated by the State of Washington's Office of Superintendent of Public Instruction (OSPI). With the emphasized focus of No Child Left Behind (NCLB), Harrah Elementary School educators were constantly struggling to find a balance between improving the

Washington Assessment of Student Learning (WASL) Proficiency Test scores, and the needed attention to provide additional non-high stakes instruction and assessment.

NCLB was passed into law in 2001 and contained high standards for all students, "The law mandated that every state needed to create their own set of high achievement standards that all students needed to meet" (U.S. Department of Education, 2002). With the added pressure of NCLB and the constant battle to raise test scores, educators at HES researched and collected WASL and DIBELS data that helped drive their instruction with the focused goal of making Adequate Yearly Progress (AYP). In accordance with the NCLB, every teacher needed to be highly qualified to teach their specific subject matter and they needed to meet certain criteria including: holding a bachelor's degree, state certification, and demonstrated competency in their specific subject area. All teachers were included in this mandate (U.S. Department of Education, 2002). At HES the researcher discovered that all teachers met the NCLB criteria of being highly qualified.

Another requirement of the NCLB was to give reading proficiency top priority. The goal was that every child was to be reading at grade level by the end of third grade. This initiative was implemented by providing schools with scientifically based reading instruction programs and funding. Funds would be available for each state to be applied for the basis of low-income children that ranged from five to seventeen years of age. Through these scientifically research-based reading programs students benefited because they met five target skills that research deemed necessary for early reading success. These skills included: phonemic awareness, phonics, fluency, vocabulary and comprehension. Said U.S Secretary of Education Margaret Spelling, "As our nation grows more diverse, we depend on our schools to ensure that future generations have the knowledge and skills to succeed" (U.S. Department of Education, 2002). This mandate is what helped drive reading instruction at HES. With a focused goal on fluency, educators were confident that their students could transition from learning to read in the Kindergarten through third grade model to reading to learn, fourth grade through sixth grade model. Educators at HES understood the value of students who received a strong reading foundation

in the early grades were better prepared, engaged, and motivated for reading the academic content, "High motivation and engagement in learning have consistently been linked with a reduction in dropout rates and increased levels of student success" (Kushman, Sieber, & Harold, 2000).

With new regulations added to the law the NCLB provided teachers with professional development and other related support. Teachers were now provided in service training to detect barriers students face in reading. Also, teachers were provided necessary tools to help guide their students to increase learning. Under the NCLB, every school was held accountable for AYP for all students. Closing the achievement gap in reading became a national priority. "The drive to improve student achievement in American schools has created a perverse incentive to push out struggling students, ideally without having to count them as dropouts" (Swanson, C.B. 2004). At HES the educators felt added pressure of making AYP and yet understood that students dropped out of school because they struggled with reading. The educators knew that the students didn't fail, the system failed the students. Educators felt an obligation and developed an approach that

focused on diagnosing the reading problem and a designed, prescriptive plan where students had interventions and assessment that helped students learn strategies on decoding text, building automaticity, and reading with comprehension for preparation of the NCLB mandated high stakes WASL testing and to be motivated and literate, life-long learners.

### Reading Fluency

"Fluency was defined as the ability to read accurately, expressively, and meaningfully at an appropriate rate" (Reyhner, 2001, p.10). Fluent readers could automatically recognize words in print, so they were able to devote their attention to the ultimate goal of decoding text, building automaticity, and reading with comprehension.

Fluency was important to teaching first grade students at HES because it provided a bridge between word recognition and comprehension. Fluent readers could focus their attention on what the text meant and then make connections among those ideas. "Students taught to decode words that are not in their oral vocabulary, end up

parroting what they read without comprehension" (Reyhner, 2001, p.8).

With the importance of reading fluency and decoding needed at HES, educators looked at how students acquired their decoding skills.

When most decoding skills are automatic, a larger part of the brain is free to focus on comprehension. Furthermore, a child who had strong basic decoding skills should move from strict decoding of every word to reading chunks or collections of words for automaticity. (Armbruster, Lahr, & Osborn, 2001, p.34)

In order for students to be fluent, confident readers they needed to be familiar with the alphabetic principle and needed to have a strong, developed background in literacy with phonemic awareness and the basics of phonics.

At HES, teachers decided to focus on the development of reading fluency by: modeling fluent, expressive reading at every opportunity. Educators initiated discussion, recounted parts of the story, shared reactions, related experience to real life, and invited students to reflect on the stories that assessed their learning and developed ownership of their learning.



Educators at HES read multiple genres of text aloud and gave the children many opportunities to practice reading with text at their independent level.

Instruction in comprehension and fluency helped students understand what they read. Other reading strategies recommended for helping students with comprehension included: direct explanation, modeling, guided practice, and application. To reach students from all backgrounds, teachers needed to be culturally sensitive in their reading practices. Teachers needed to constantly adjust student learning styles and kept current with research-based strategies needed to advance student learning. Finally, teachers must hold all students accountable and continue to set high learner expectations' (Geneva & Banks, 2000)

Educators also provided feedback during NWF activities and assessments through DIBELS progress monitoring. "Children gain automaticity the way we all gain mastery of anything -- plain old practice" (Stahl, Huebach, & Holcomb, 2005, p. 33).

First grade students at HES that became fluent motivated readers discovered the importance of being

independent readers. They developed a love for books and reading that would guide them toward comprehension.

### Dynamic Indicators of Basic Skills

The DIBELS Nonsense Word Fluency (NWF) measure is a standardized, individually administered test of the alphabetic principle - including letter-sound correspondence and the ability to blend letters into words in which letters represent their most common sounds.

(Howard, Gansle & Kenton, 2006, p.1)

The researcher reviewed data from first grade classrooms at HES which administered the DIBELS screening assessment. "The DIBELS assessment is a standardized screen that measures early literacy development and monitors the development of reading skills focusing on phonological awareness, alphabetic understanding, and automaticity and fluency" (Welsh, 2006 p.182).

The students were presented with randomly ordered nonsense words and asked to produce verbally the individual letter sound of each letter or verbally produced, or read,

the whole nonsense word pronounced correctly in one minute. Because the measure was fluency based, students received a higher score if they were phonologically decoding the word and received a lower score if they were provided letter sounds in isolation.

The purpose of the DIBELS assessment was to accumulate data for identifying students that were having difficulty with NWF and reading. Educators used information from DIBELS assessment data to provide quality interventions with phonemic awareness, automaticity and fluency for students who were identified as intensive (Tier III), strategic (Tier II), or at benchmark standards.

First grade teachers at HES needed to focus on developing individual interventions that targeted phonemic awareness, automaticity fluency, and comprehension based on the DIBELS data with the aid of technology. Research suggested using materials like computer software and listening centers that would help students effectively practice reading fluency and help motivate students and keep them engaged with phonemic awareness activities.

"Some software or game-like activities can promote reading speed by providing feedback on work-attack

skills and reading comprehension that help limit the amount of words in the text and focus on fluency" (Welsh, 2006 p.183).

Students who were motivated to achieve higher learning had the capacity to do better in school than those who were not motivated. Motivation was one of the determining factors in student achievement because students had a purpose for wanting to achieve. According to Eccles et al. (1998), as a child grows older, academic achievement slowly declines. Reasons for this decline included: less teacher attention, limited parental involvement, individualized instruction and stresses associated with academic embarrassment.

Individual instruction with interventions from the *Starfall* computer program, which engaged students with phonemic awareness, fluency, and comprehension lessons, enabled teachers to supervise the improvement of learners' reading fluency and accuracy by providing activities with remedial lessons that helped students improve their reading rate and raised their overall reading fluency. This program aided instructors with additional time to promote *Starfall* skill-building

activities, which helped students with their DIBELS NWF assessment.

### Starfall Reading Instruction

The ability to read affected students' progress in all academic areas at HES and over the years, many interventions had been developed to help students with reading disabilities, "In the 1980's when computers started to become commonplace in public school classrooms, computer programs to help teach reading became a growing trend in reading education research, we are just beginning to clarify the cognitive and affective consequences of using computers to teach literacy" (Hall, Hughes, and Filbert, 2000). Investigations have shown that computer tools had enhanced instruction. The use of word processors produced better writing. Multimedia presentations facilitated comprehension. Computers benefit diverse learners by allowing for individualized instruction.

According to Scherer (2001) on Gardner's research (1999) addressed reading problems by understanding learning styles and multiple intelligences related to reading mastery. Gardner delineated a list of seven intelligences

that deal with the way humans learn, including: linguistic, logical-mathematical, musical, spatial, interpersonal and intrapersonal. Gardner believed all humans possessed uniqueness in the way they learned. Accordingly, these multiple intelligences provided teachers an opportunity to teach to the appropriate learning styles of students.

Technology is a way to allow the utilization of various intelligences. Technology can provide students with the proper medium through which they may demonstrate and present their mastery of the subject through technology-based project learning. With so many media available in today's classrooms, the utilization of technology as a means to demonstrate mastery of content becomes not only convenient but also effective as a teaching/learning tool. The learners become teachers in their presentations and teachers become true advisers and mentors to student learning. (Gen, 2000. p.5)

The *Starfall* Method of reading instruction was developed for the emergent reader to meet their instructional needs as they learn to read. Educators at HES believed in Gardner's research that addressed

learning styles and multiple intelligences related to reading mastery and discovered that the *Starfall* computer program aligned well with the seven multiple intelligences. This helped educators understand that all students learn differently and that appropriate individualized instruction benefited all students with diverse needs.

One factor related to low student achievement in reading was the Social Economic Factor. Students who lived with families that had low incomes and lived below the poverty level were more at risk of having low literacy skills (Alliance for Excellent (AEE), 2002). According to the U.S Census Bureau, 28.7 million children currently live in poverty across the United States (U.S Bureau of Census, 2003). Caldwell & Ginther (1996) found that students from a low socioeconomic background made up the largest population of students considered to be at risk and in danger of not graduating from high school.

Students at HES have limited resources and access to computers in their home. Educators used the *Starfall* computer program because it kept the students engaged and motivated them to read. Poverty was a factor for low

student achievement in the classroom, but all students were given the same opportunities for reading practice. Parents were encouraged to work with their child on *Starfall* in the classroom so they could see how reading was fun, entertaining, and valuable for their child success in school and beyond.

The researchers of the *Starfall* program suggested that students who have a difficult time learning to read should have the following interventions:

1. Phonemic awareness
2. Use text that is composed of words that use sound-spelling correspondences that children have learned
3. Use interesting stories to develop vocabulary and language comprehension
4. Involve a combination of explicit instruction in word recognition skills and reading comprehension strategies with opportunities to apply and practice these skills in literature.

(Howard, Gansle, Kenton, 2006. p.5)

*Starfall* was a powerful tool used in the classroom to promote motivation, decoding, automaticity, fluency. Motivation was the key to getting students to take a



proactive approach to reading. "Motivation was one of the determining factors in student achievement because students had a purpose for wanting to achieve," (Scherer, M. (1999).

### Summary

Educators at HES were concerned about the numbers of first grade intensive and strategic students who were not making sufficient gains on their NWF assessment from the DIBELS test. The low score, reflected low phonics skills which hindered decoding text, reading accuracy, comprehension, reading speed, and their skill at becoming fluent readers. Therefore, HES needed to change their intervention program in order to adequately accommodate the needs of all students who struggled with NWF.

Reading fluency was a fundamental asset to building comprehension in reading for school success. As educators at HES, we needed to focus on phonemic awareness, alphabetic principals, and reading fluency in order for the first grade students to become successful readers.

Because of NCLB, educators at HES provided additional time and ample opportunities for their students to practice fluency, automaticity, and phonemic awareness. With the use of technology and teacher motivation, the foundations

was set for building fluent, literate readers, life-long learners, and break the cycle of poverty.

## CHAPTER 3

### Methodology and Treatment of Data

#### Introduction

The purpose of this experimental study was to determine *Starfall* computer intervention provided by the HES homeroom teacher improved fluency scores of first grade students identified as intensive or strategic on the DIBELS screening assessment.

To accomplish this purpose, a review of selected literature was conducted, baseline data was obtained and analyzed, and related conclusions and recommendations were formulated.

#### Methodology

The researcher conducted an experimental study at HES located in Harrah Washington. The researcher tested two first grade classrooms where the student's ages ranged from six to seven years-old. The premise was to determine

whether the *Starfall* computer program would be an effective intervention for students who struggled with decoding and NWF based on their DIBELS assessment screen.

### Participants

A convenience sample was used which involved those students enrolled in the first grade at the time of the experimental study.

There were 40 students enrolled in the study in which 29 of those students were Native American and the other eleven students were Hispanic.

Most of the Native American students lived on the Yakama Nation Reservation where the elementary school was located. The area was low-income with 84.1% of the students receiving free or reduced lunch. There was very little parent involvement, and HES was the only elementary school in the district of White Swan.

### Instrument

DIBELS was a commonly used assessment tool at HES as an indicator of student performance. Educators at HES considered DIBELS to be reliable, consistent, and a good measure for reading assessment.

The first grade students were given the DIBELS screening assessment at the beginning, middle, and end of the 2006-2007 school years. The students were individually screened by their homeroom teachers and given instructions on the process of the assessment.

### Design

Throughout this experimental study, the researcher used a non-equivalent control group design which consisted of two groups of 20 students with a pre-test and a post-test. A convenience sample was used and by coincidence there were an equal number of students in both groups.

The treatment group X consisted of 20 students who received instruction on building fluency and an additional 20 minutes of *Starfall* computer intervention. The control group Y consisted of 20 students and only received fluency instruction.

The researcher recognized maturation, mortality and regression as common threats to the internal validity of the experimental study. Maturation as referred to as any "natural, physical, intellectual, and emotional changes that occur in the participants over a period of time" (Gay, 2000). The researcher recognized that incoming first grade

students would change over the course of the year due to natural maturation.

Mortality in the study was recognized as students would transition in and out of the classroom at differing times during the school year for numerous reasons.

Statistical regression was accounted for in the choosing of the non-equivalent group design using a convenience sample of participants. All participants were chosen as low achievers requiring interventions in reading.

### Procedure

There were 15 steps the researcher followed in the conduct of this study:

1. The researcher obtained permission for this study from the principal of HES.
2. The researcher defined the basis of this study, discussed hypothesis, reviewed how the participants would be chosen, and set individual expectations of the teaching staff.
3. The researcher obtained permission from the parents to participate in this study.

4. In September of 2006, each first grade student at HES was timed for one minute on NWF, and alphabet recognition. After completion of the DIBELS screen, each student was identified as Intensive (Tier III), Strategic (Tier II), or at Benchmark standard.
5. The researcher collected the DIBELS data and conducted the experimental study.
6. The researcher used a convenience sample and by coincidence there were an equal number of students in the control and treatment group.
7. Educators were asked to maintain consistent reading instruction with the use modeled expression, good phrasing with reading fluency. Student also worked on letter sounds and fluency activities while the teacher monitored their reading.
8. Students were provided opportunity to read aloud various types of texts.
9. The control group was given 20 minutes of *Starfall* interventions to build fluency and comprehension.
10. The treatment was provided regular instruction without additional interventions.

11. The teacher provided DIBELS progress monitoring for the control and treatment groups weekly to track student progress.
12. Parents were notified at their child's conferences of progress made on the DIBELS weekly progress monitoring charts.
13. Discussion and professional development was offered for the staff at HES on reading fluency and comprehension strategies.
14. In May, 2007 Students were given the final DIBELS assessment and their final scores were analyzed. The researcher ran an independent t test and found if *Starfall* intervention made significant impact on DIBELS NWF scores.
15. The researcher reported the findings to the principal, reading coach, and first grade team.

#### Treatment of the Data

The data was taken from the NWF DIBELS assessment. The researcher analyzed the pre-test and post-test data and compiled it into a t test that determined if there was significance between the treatment and the control group.

## Summary

The researcher used a convenience sample and 40 first grade students participated in this study. There were 15 steps the researcher followed in the conduct of this experimental study to determine if *Starfall* computer intervention improved fluency scores in first grade classrooms at HES.

The researcher recognized maturation, mortality and regression as common threats to the internal validity of the experimental study.

The instrument used in this study was DIBELS; educators at HES believed it to be a commonly used, reliable, consistent assessment tool as an indicator of student performance for reading.

## CHAPTER 4

### Analysis of the Data

#### Introduction

This experimental study sought to determine whether *Starfall* intervention provided by the HES homeroom teacher



would improve NWF scores measured by the DIBELS assessment. Chapter 4 contains a description of the environment, hypothesis, and results of the study.

#### Description of the Environment

This case study was conducted at HES located in Harrah, Washington. There were 500 students attending HES, 98 of which were in the first grade. The population consisted of 85% Native American, 10% Hispanic, and 5% Caucasian. The researcher tested two first grade classrooms where the student's ages ranged from six to seven years old. There were 40 students enrolled in the experimental study in which 29 of those students were Native American and the other eleven students were Hispanic. Three students had an Individual Educational Plan for speech and language disabilities.

The first grade students were given the DIBELS screening assessment at the beginning, middle, and end of the 2006-2007 school years. The students were individually screened by their homeroom teachers and given instructions on the process of the assessment.

Each student was timed for one minute on NWF and alphabet recognition. After completion of the DIBELS screen, each

student was identified as Intensive (Tier III), Strategic (Tier II), or at Benchmark standard.

DIBELS was a commonly used assessment tool at HES as an indicator of student performance. Educators at HES considered DIBELS to be reliable, consistent, and a good measure for reading assessment.

### Hypothesis

Students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency will make significant gains on the Dynamic Indicators of Basic Early Literacy Skills Nonsense Word Fluency screening assessment post-test. This focused goal was vital for struggling students to become fluent readers.

### Null Hypothesis

There was no significant difference between students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency and the Dynamic Indicators of Basic Early Literacy Skills screening assessment post-test. The significance was determined by  $p \geq .05$ ,  $.01$ , and  $.001$ .

### Results of the Study

Table 1 described the post-test results for the control group Y and the treatment group X. A convenience sample was taken and by coincidence there were the same number of students in each group. The control group Y received regular reading instruction with out additional interventions and the treatment group X received 20 minutes of *Starfall* computer intervention. The mean of the control group was 40.85 and the mean of the treatment group was 34.55.

Table 1

Data for DIBELS Post Test

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Treatment X	Score	Control Y	Score
Student A	11	Student 1	4
Student B	36	Student 2	8
Student C	16	Student 3	10

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Student D	25	Student 4	9
Student E	13	Student 5	15
Student F	26	Student 6	13
Student G	27	Student 7	24
Student H	25	Student 8	27
Student I	35	Student 9	28
Student J	45	Student 10	42
Student K	59	Student 11	34
Student L	43	Student 12	30
Student M	34	Student 13	59
Student N	45	Student 14	39
Student O	60	Student 15	52
Student P	45	Student 16	69
Student Q	66	Student 17	59
Student R	76	Student 18	55
Student S	72	Student 19	56
Student T	58	Student 20	58

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Table 2 represented the distribution of t. The mean of the control group was 40.85 and the mean of the

treatment group was 34.55. The data showed the t-value  
0.99 and the df to be 38.

Table 2

Statpak Analysis of Post Test DIBELS Data

Statistics	Value
No. of scores in Group X	20
No. of scores in Group Y	20
Sum of Scores in Group X	817.00
Sum of Scores in Group Y	691.00
Mean of Group X	40.85
Mean of Group Y	34.55
Sum of Squared Score in group X	40563.00
Sum of Squared Score in group Y	32037.00
SS of group X	7188.55
SS of group Y	8162.95
Degree of freedom	38
t value	0.99

Table 3 represented the distribution of t. The data showed the df to be 38, with significance at .05 of 2.021, .01 of 2.704, and .001 of 3.551.

Table 3

Distribution of t

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df	p		
	.05	.01	.001

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### Findings

These data revealed that the mean of the control group was 40.85 and the mean of the independent group was 34.55. The t value was 0.99 and the df was 38. There was no significant difference between the control group and the treatment group at .05, .01, and .001.



The null hypothesis stated that there was no significant difference between students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency and the Dynamic Indicators of Basic Early Literacy Skills screening assessment post-test. Significance was determined by  $p \geq .05$ , .01, and .001. The null hypothesis was accepted at .05, .01, and .001.

The hypothesis stated that Students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency will make significant gains on the Dynamic Indicators of Basic Early Literacy Skills Nonsense Word Fluency screening assessment post-test. The hypothesis was not supported at .05, .01, and .001.

### Discussion

The researcher expected the DIBELS scores to increase with the *Starfall* computer intervention at HES. The DIBELS assessment was a commonly used among other school districts as an indicator of student performance.

The researcher considered the DIBELS assessment to be a valid, reliable, and consistent measure of academic progress. The researcher's expectations of allowing additional time with *Starfall* computer program to increase

DIBELS scores at HES was not supported by the researcher's hypothesis.

### Summary

Harrah Elementary teachers were concerned about the numbers of first grade Tier III and Tier II students who were not making sufficient gains on their NWF assessment DIBELS test.

In Chapter 4, the researcher presented Table 1, Table 2, and Table 3 that illustrated how teacher interventions enhanced NWF DIBELS scores. The findings concluded that significance was not found at .05, .01, and .001. The null hypothesis was accepted and the hypothesis was not supported.

*Starfall* computer program was a great interactive tool used for intervention but this study does not show that it had a significant impact on the DIBELS NWF assessment.

## CHAPTER 5

### Summary, Conclusions and Recommendations

#### Introduction

The purpose of this experimental study was to determine if *Starfall* computer intervention at the elementary school level provided by the reading teacher improved DIBELS testing scores of the first grade students at HES.

To accomplish this purpose, a review of selected literature was conducted, baseline data were obtained and analyzed, and related conclusions and recommendations were formulated.

### Summary

Harrah Elementary teachers were concerned about the numbers of first grade Tier III and Tier II students who were not making sufficient gains in their NWF assessment from DIBELS test. The low score, reflected low phonics skills which hindered decoding text, reading accuracy, comprehension, reading speed, and their skill at becoming fluent, confident, motivated, life-long readers.

Schools that have used *Starfall* were seeing their students become motivated toward exploration and discovery in their classes. Having made a change of this magnitude required the establishment of achievable goals and/or steps.

According to Welsh (2006) some software or game-like activities can promote reading speed by providing feedback on work-attack skills and reading comprehension that help limit the amount of words in the text and focus on fluency. The additional time permitted projects

and interactive strategies such as mock trials and simulations. *Starfall* was a powerful tool used in the classroom to promote motivation, decoding, automaticity, fluency. Motivation was the key to getting students to take a proactive approach to reading.

The data obtained from the study determined that The null hypothesis which stated there was no significant difference between students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency and the Dynamic Indicators of Basic Early Literacy Skills screening assessment post-test. The significance was determined by  $p \geq .05$ , .01, and .001. The null hypothesis was accepted.

The hypothesis which stated that Students provided with *Starfall* computer intervention focusing on decoding, automaticity and fluency will make significant gains on the Dynamic Indicators of Basic Early Literacy Skills Nonsense Word Fluency screening assessment post-test. The hypothesis was not supported.

### Conclusions

Based on a review of selected literature and major findings produced from the present study, the following conclusions were reached:

1. The findings concluded that significance was not found at .05, .01, and .001. *Starfall* intervention at HES shown not to have made a difference in DIBELS NWF test scores.
2. The *Starfall* computer program did not show promise at HES in increasing NWF DIBELS test scores for first grade students.

#### Recommendations

Based on a review of selected literature and major findings produced from the present study, the following recommendations were reached:

1. The researcher recommended additional studies to be completed in the area of reading interventions at HES at the first grade levels.
2. The researcher recommended teachers should receive additional professional development in reading and intervention.

3. The researcher recommended further studies be completed in computer reading interventions to increase fluency scores on the DIBELS assessment.

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