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ABSTRACT

This report outlines a program for improving reading fluency. The targeted population consisted of second and third grade students from three separate communities located in suburbs of a major metropolitan area. The need for fluency improvement is documented through teacher observations, reading fluency assessments, standardized reading test results, and a reading attitude survey of the students themselves. Analysis of probable cause data revealed that fluency is not taught as a component of reading programs. With most reading instruction focusing on comprehension and vocabulary, the oral fluency piece does not develop enough for students to view themselves as readers. This may negatively impact student attitude toward reading. Analysis of instructional strategies revealed less emphasis on fluency practice, thus creating a pattern of poor fluency contributing to students' poor self-identification as readers. A review of solution strategies suggested in literature on the topic combined with an analysis of students' needs resulted in the selection of four intervention strategies: fluency modeling, paired reading, repeated reading, and dramatization. These four strategies provided a very balanced approach to address the issue of fluency. The intervention strategies contributed to substantial gains in students' reading fluency. The students' attitude toward reading improved and they became much more enthusiastic about reading aloud. (Contains 25 references, and 6 tables and 3 figures of data. Appendixes contain a teacher's pretest/posttest recording sheet, a student pretest/posttest graph, and the student reading attitude survey.) (Author/RS)

EXAMINING READING FLUENCY
IN PRIMARY CHILDREN

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Abstract

This report outlines a program for improving reading fluency. The targeted population consisted of second and third grade students from three separate communities located in suburbs of a major metropolitan area. The need for fluency improvement is documented through teacher observations, reading fluency assessments, standardized reading test results, and a reading attitude survey of the students themselves.

Analysis of probable cause data revealed that fluency is not taught as a component of reading programs. With most reading instruction focusing on comprehension and vocabulary, the oral fluency piece does not develop enough for students to view themselves as readers. This may negatively impact student attitude toward reading. Analysis of instructional strategies revealed less emphasis on fluency practice, thus creating a pattern of poor fluency contributing to students' poor self-identification as readers.

A review of solution strategies suggested in literature on the topic combined with an analysis of students' needs resulted in the selection of four intervention strategies: fluency modeling, paired reading, repeated reading, and dramatization. These four strategies provided a very balanced approach to address the issue of fluency.

The intervention strategies contributed to substantial gains in students' reading fluency. The students' attitude toward reading improved and they became much more enthusiastic about reading aloud.

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CHAPTER 1

PROBLEM STATEMENT AND CONTEXT

Problem Statement

The students of the targeted second and third grade classes exhibit a lack of reading fluency which interferes with their reading progress and comfort level. Evidence for the existence of the problem includes recorded teacher observations, assessments that indicate the student's reading fluency, and students' attitudes about their own reading.

Building One

Local Setting

Building number one is located in a suburb of a major metropolitan area. The school has an enrollment of 360 students. The student population's racial makeup is 30.3% White, 65.0% Black, 2.5% Hispanic, and 2.2% Asian. The school's low-income population is 11.4%. The student attendance rate is 96.9% and the mobility rate is 12.7% (School Report Card, Building One, 1998).

There are 40 faculty and staff members, 36 females and 4 males. The teaching faculty includes 17 classroom teachers, 2 special education resource teachers, 1 art teacher, 1 music teacher, 1 band teacher, 1 physical education teacher, 1 speech teacher, 1 media specialist, and 1 part-time reading specialist. The remainder of the staff is comprised of a principal, a psychologist, a social worker, 5 teacher aides, 1 media aide, 1 nurse's aide, a school secretary, a gifted teacher, and 2 custodians (School Report Card, Building One, 1998).

The building is a one-level structure and was built in 1958. The school has a media center, a gymnasium, art and music rooms, and 19 classrooms. It is situated in a residential

neighborhood and has a park behind it which is available for student's use. The school includes grades 3, 4, and 5 (School Report Card, Building One, 1998).

The educational program has a heavy emphasis on reading and math. Each day 143 minutes are devoted to Reading and Language Arts instruction, and 66 minutes per day are devoted to Math instruction (1998 School Report Card, Building One). The school uses a manipulative-based math program. Students who meet the criteria are included in the school's gifted program. The school utilizes its strong parent and grandparent volunteer base to support oral reading at all grade levels.

Community Setting for Building One

Building number one is part of a suburban school district which serves four communities. These communities are suburbs of a major metropolitan area.

Community A

Community A has a population of 4,250 of which 77.2% are White, 16.1% are Black, 1.3% are Hispanic, and 1.1% are Asian. The average income of the residents is \$112,022. It is a residential community with the average home valued at \$212,000. The community is served by one elementary district (U.S. Department of Commerce, 1990).

Community B

Community B has a population of 11,300 consisting of 53% White, 44.3% Black, 3.2% Hispanic, and 2.7% Asian. It has a combination of residential, retail, and corporate areas. The average income of the residents is \$58,893. The average home value is \$98,901. Two elementary school districts serve the community (U.S. Department of Commerce, 1990).

Community C

Community C is primarily a residential community with an average home value of \$97,289 and an average income of \$47,426. The community is 76.1% White, 22.2% Black, 3.3% Hispanic, and 1.8% Asian with a total population of 10,500. Two elementary districts are located in this suburb (U.S. Department of Commerce, 1990).

Community D

Community D has a population of 24,600, which is 74.2% White, 24.6% Black, 3.1% Hispanic, and 1.1% Asian. The area is comprised of residential, retail, and industrial areas. The average income of the residents is \$36,000 and the average home value is \$71,776. Community D is served by 3 elementary school districts (U.S. Department of Commerce, 1990).

Building Number One School District

The district, which includes Building Number One, is a large elementary district that serves 2,331 students. The district has 6 schools and includes a paired-schools model. There is an early childhood building, 2 primary buildings (grades K-2) which are paired with 2 elementary buildings (grades 3-5), and a middle school (grades 6-8). The district has a teaching staff of 138 which is 79.7% White, 17.4% Black, 0.7% Hispanic, and 2.2% Asian. The staff is 88.4% female and 11.6% male. There is an average teaching experience of 15.8 years and 32.6% of the staff has a Master's Degree or above. The teacher to student ratio is 21:1. The district is 37.6% White, 56.6% Black, 2.5% Hispanic, and 2.2% Asian with a low-income population of 11.7% (School Report Card, Building One, 1998).

The issue of racial stability is common to all 4 communities served by the district. Each suburb is actively involved in finding solutions to the problem of re-segregation. The issue of

racial stability is addressed by the district with the use of the paired-schools model instead of neighborhood schools.

Building Two

Local Setting

Building Two has a total student population of 643. The racial/ethnic backgrounds and percentages are as follows: 96.9% White; 0.2% Black; 0.8% Hispanic; 2.0% Asian/Pacific Islander; and 0.2% Native American. Among the students, 2.3% come from low-income families and 0.9% have a limited English proficiency. Attendance rate is 96.7% and the student mobility rate is 2.5%. Chronic truancy is non-existent (1998 School Report Card, Building Two).

This facility was built in 1958. An addition of 6 classrooms was put on in 1989. The building is a one-level structure which sprawls over several acres of land. There is an asphalt playground as well as an open field of grassy playground with swings, super sets, and a basketball court. There are 32 classrooms, a media center/library, art room, band room, primary library, gym, and multi-purpose room. There is a conference room and several smaller office/service areas for speech, counseling, and other support staff.

The building is set up in a K through 5 traditional arrangement. There are 42 certified faculty members, 4 of whom are male and the rest are female. There are 4 sessions of Kindergarten (2 in the A.M. and 2 in the P.M.), 4 first grades, 5 second grades, 5 third grades, 5 fourth grades, and 5 fifth grades and 1 Early Childhood class. There is a gifted pullout program which varies its participants according to their needs. The special education program is a full-inclusion treatment, each child having his/her own aide. The building has a before and after school child care program. There is an emergent learner program as well as reading resource for

children who are slow learners but not eligible for Learning Disabled services. Time devoted to the teaching of core subjects is as follows (minutes per day): Mathematics – 60; Science – 24; Language Arts – 120; and Social Science – 24. Students are also given the following specials (minutes per week): Physical Education – 80; Art – 40; and Music – 40 (1998 School Report Card, Building Two). There is a band and chorus program available for fourth and fifth graders. Other support services are Learning Disabilities and Speech and Language. There is a part-time ESL teacher as well. One counselor services the school for half days. The PFA parents provide many hours of volunteering in the school. There are also volunteers from a nearby retirement village who contribute time in library services and tutoring.

Community E

Community E has a total population of 4,199. It is located in a suburb of a major metropolitan area. The population breakdown by race/ethnicity is as follows: 94.62% White; 5.14% Asian; and .24% Other. The number of males is 2,109 and the number of females is 2,090. The percent of population less than 18 years of age is 23.7%. The percent of population 65 years of age and older is 11.7%. There are 1,282 single-family detached homes, 145 1-unit attached homes, and 25 structures with 2 to 9 units. The property value median is \$206,400. The household income ranges are: 140 at \$0 - 24,000, 365 at \$25,000 – 49,000, 472 at \$50,000 – 99,000, 215 at \$100,000 – 150,000, 197 at \$150,000+, and 41 considered poverty. The community is surrounded by forest preserves and many conveniences such as shopping, theaters, parks, and recreational opportunities (U.S. Department of Commerce, 1990).

The school district is a small one with three school buildings; two are elementary and one is a middle school. Teacher/administrator characteristics show a total of 125 teachers in the district, 19.3% male and 80.7% female. Racial background is 99.2% White and 0.8% Hispanic.

The average number of years teaching experience is 15.3 years, with 33.7% of the teachers holding Bachelor's Degrees and 66.3% holding Master's Degrees and above. The pupil-teacher ratio is 19.4:1. On the salary scale, this district's average is \$49,025 (1998 School Report Card, Building Two).

Since 1989 all three buildings have had additions and major school improvements. The additions were needed to accommodate the growing numbers of students due to the development of sub-divisions. The school district has purchased and installed state of the art technological equipment in all three buildings. All classrooms have computers and Internet access. Teacher committee work has recently overhauled its curriculum design toward teaching with a concept-based thematic approach. The most recent district-wide issue was the discussion of basal reading instruction versus literature-based instruction. In the two elementary schools different approaches were being used for the reading program. One school used literature-based reading with total support from their administrator and parents. The other school used a basal reading series because that administrator and those parents supported it. The dilemma was that when the students mixed at the middle school, confusion existed on the part of the students and the parents about the reading program. This district-wide issue spilled into the community and caused great problems for the students, teachers, parents, and administrators. It became more of an issue when the school board adopted the concept-based approach because integrating content material with reading is the best prescribed way to implement concept instruction. Since that adoption, both elementary schools use a literature-based reading approach. The parents in this community are college-educated and have very strong opinions about curriculum.

Building Three

Local Setting

Building Three is located in a suburb of a major metropolitan area. The school has a population of 332 students in grades PreK through 3. Of the 332 students, 35.2% are White, 59.9% are Black, 2.7% are Hispanic, and 2.1% are Asian. The school's low-income rate is 9.0%. Students' mobility rate is at 21.4%. The attendance rate for the school is 97.0% and chronic truancy is nonexistent (1998 School Report Card, Building Three).

There are 28 faculty and staff members at the school, 25 females and 3 males. The teaching staff includes 3 first grade teachers, 4 second grade teachers, 5 third grade teachers, 2 Kindergarten teachers, 1 PreKindergarten teacher, 1 music teacher, 1 physical education teacher, 1 speech pathologist, 1 Title I teacher, 1 cross-categorical teacher, 1 Learning Center Director, and 1 social worker. The remainder of the staff is made up of three aides, a part-time psychologist, a secretary, and a principal (1998 School Report Card, Building Three).

The school was built in 1967 and is a one-level structure. The 19 classrooms in the school are comprised of 1 PreKindergarten, 2 Kindergartens, 3 first grades, 4 second grades, 5 third grades, 1 cross-categorical room, 1 learning center, and 1 computer room. In addition, the stage in the gymnasium was converted into 2 classrooms that are utilized by the social worker and the Title I teacher. The school is located within a middle-class sub-division on a quiet side street. In the rear of the school there is a large blacktop area as well as a large field behind that. There are 2 sets of monkey bars for children to play on.

The majority of the school day is devoted to Language Arts (120 minutes per day) and Mathematics (60 minutes per day). The remainder of the school day is split between Science (30 minutes per day) and Social Science (24 minutes per day). There is support from Special

Education services as well as from Title I services for students who demonstrate need. In addition, there is a cross-categorical room for students who cannot be placed within a self-contained regular education classroom. In reading classes in first through third grade, a computer program that tests comprehension is used. The school recently employed an accelerated teacher who will assist teachers, at all grade levels, in accelerating students who are not meeting state benchmarks (1998 School Report Card, Building Three).

Community F

Community F has a population of 24,850 of which 79% are White, 18% are Black, 2% are Asian, and 1% fall into the "Other" category. The average income of the residents is \$57,751. It is primarily a residential community with the average home valued at \$116,950. This community is middle-class and is comprised of only single-family dwellings. Two elementary school districts serve the community (U.S. Department of Commerce, 1990).

The school district which serves Building Three is a very small one that includes only two schools. The first school is the PreK through 3rd grade school. The second school has an elementary section for grades 4 and 5 as well as a junior high section for grades 6 through 8. The district serves a total of 911 students. There are a total of 55 teachers in the district. The average teacher has 13.5 years of teaching experience and 37.6% of the staff has a Master's Degree or above. The staff is 80.0% female and 20.0% male. The teacher to student ratio is 18.6:1. The teaching staff is 94.6% White, 3.6% Black, and 1.8% Hispanic. The average teacher salary for the 1997 – 1998 school year was \$42,600 (1998 School Report Card, Building Three).

The district recently had a Reading Committee working to select a new reading series for adoption. In addition, the practice of tracking (in reading) has been eliminated. Reading in grades 1 through 3 is now self-contained. Members of the community (parents) have concerns

that their children will receive a multi-cultural education that will meet their diverse needs. Workshops and continuing education in this area have been on-going. The issues of racial stability and student mobility are concerns as well.

National Context.

Reading achievement in the United States is low. According to the most recent National Assessment of Education, 44% of U.S. students in elementary and high school read below the basic level (Collins, 1997). Educators often describe reading problems in terms of fluency and research demonstrates a correlation between fluency and reading comprehension (Breznitz, 1987). There is a growing awareness though that oral reading fluency is a neglected aspect of reading instruction (Allington, 1983; Anderson, 1981). Fluent oral reading is an important skill because it facilitates the comprehension of both reader and listener (Mounsteven, 1990). When children read well, they will have the confidence needed to identify themselves as readers. According to the automaticity theory, a fluent reader decodes text automatically – that is, without attention - thus leaving attention free to focus on comprehension (Samuels, 1997). Much research in the psychology of reading indicates that fluent word recognition may be almost a necessary condition for good comprehension and enjoyable reading experiences (Nathan & Stanovich, 1991).

CHAPTER 2

PROBLEM DOCUMENTATION

Problem Evidence

Researchers looked at available standardized test scores for problem evidence. Buildings One, Two, and Three use different standardized tests, however all scores are reported from second grade. Building One students use the Cognitive Test of Basic Skills (See Figure 1). Building Two uses the Iowa Test for Basic Skills (See Figure 2). Building Three uses the Stanford Achievement Test (See Figure 3). The scores most significant to the researchers were the total reading scores. Figures 1, 2, and 3 show the frequency distribution of the students' reading scores. Building One has a high number of students who scored in the below average range. Building Two presents a traditional bell-curve distribution of scores. Building Three scores showed a greater number of students at or above grade level. Overall, 39 students at or below grade level indicate a reading concern. While these scores are measurable indicators of reading achievement, the baseline fluency test gave a clearer indication of the students' actual reading fluency rate as compared to their classmates. The researchers provided a grade specific reading passage. The test was brief (50 – 150 words). This was administered at the beginning of the school year. The researchers wanted to establish an average reading rate for each classroom. The standard deviation indicated to them that a significant number of students were considerably above or below the mean (See Table 1).

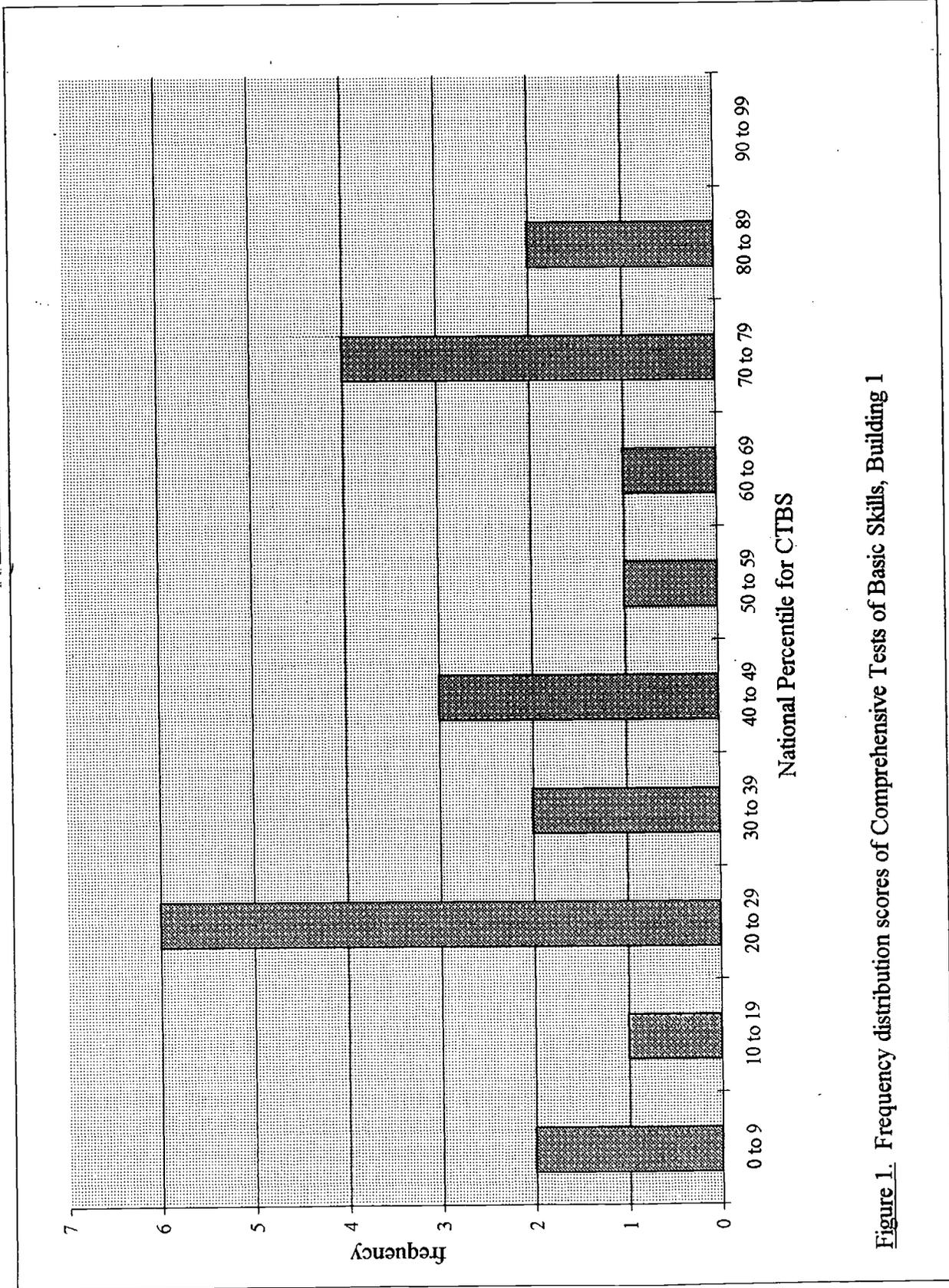


Figure 1. Frequency distribution scores of Comprehensive Tests of Basic Skills, Building 1

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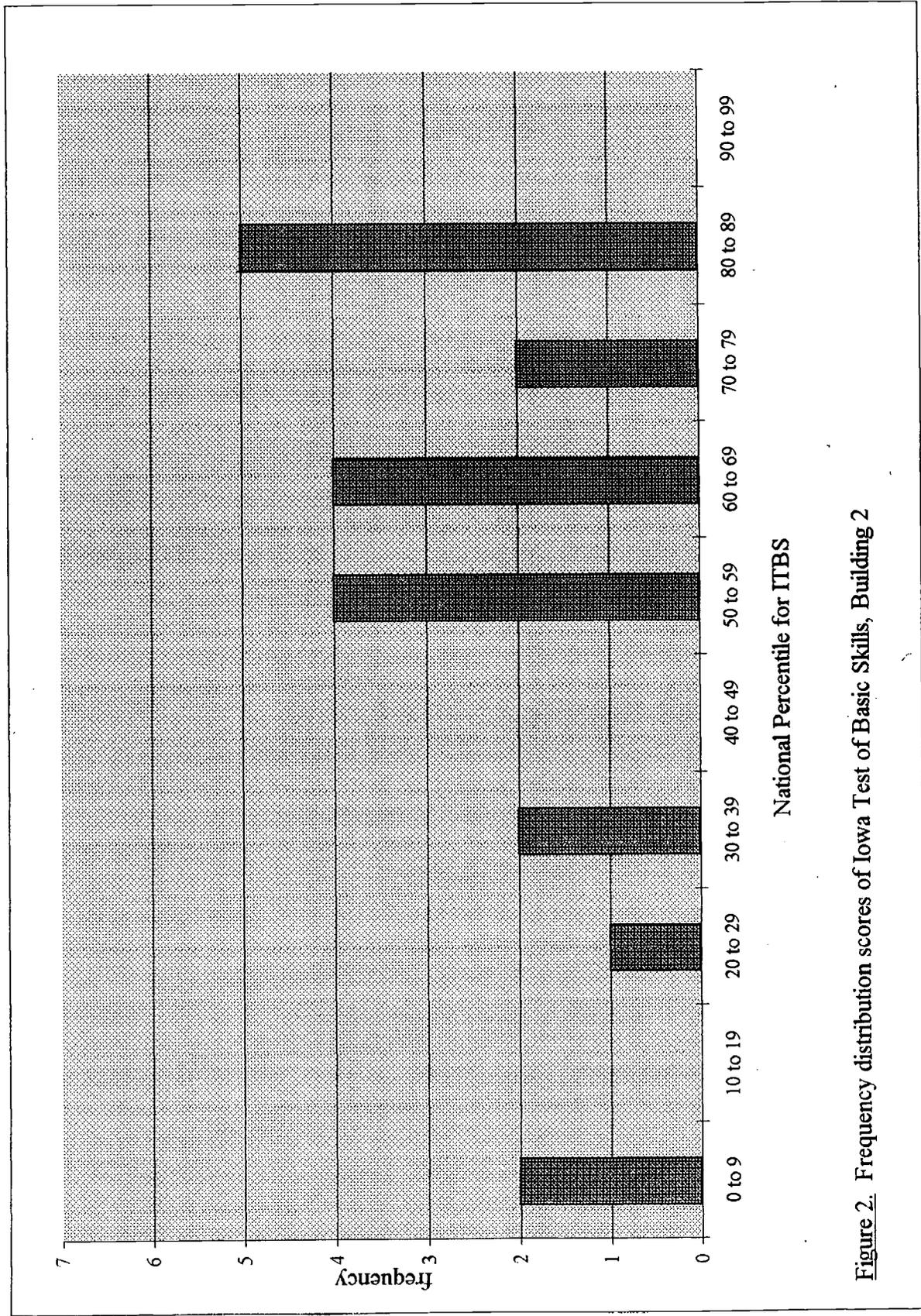


Figure 2. Frequency distribution scores of Iowa Test of Basic Skills, Building 2

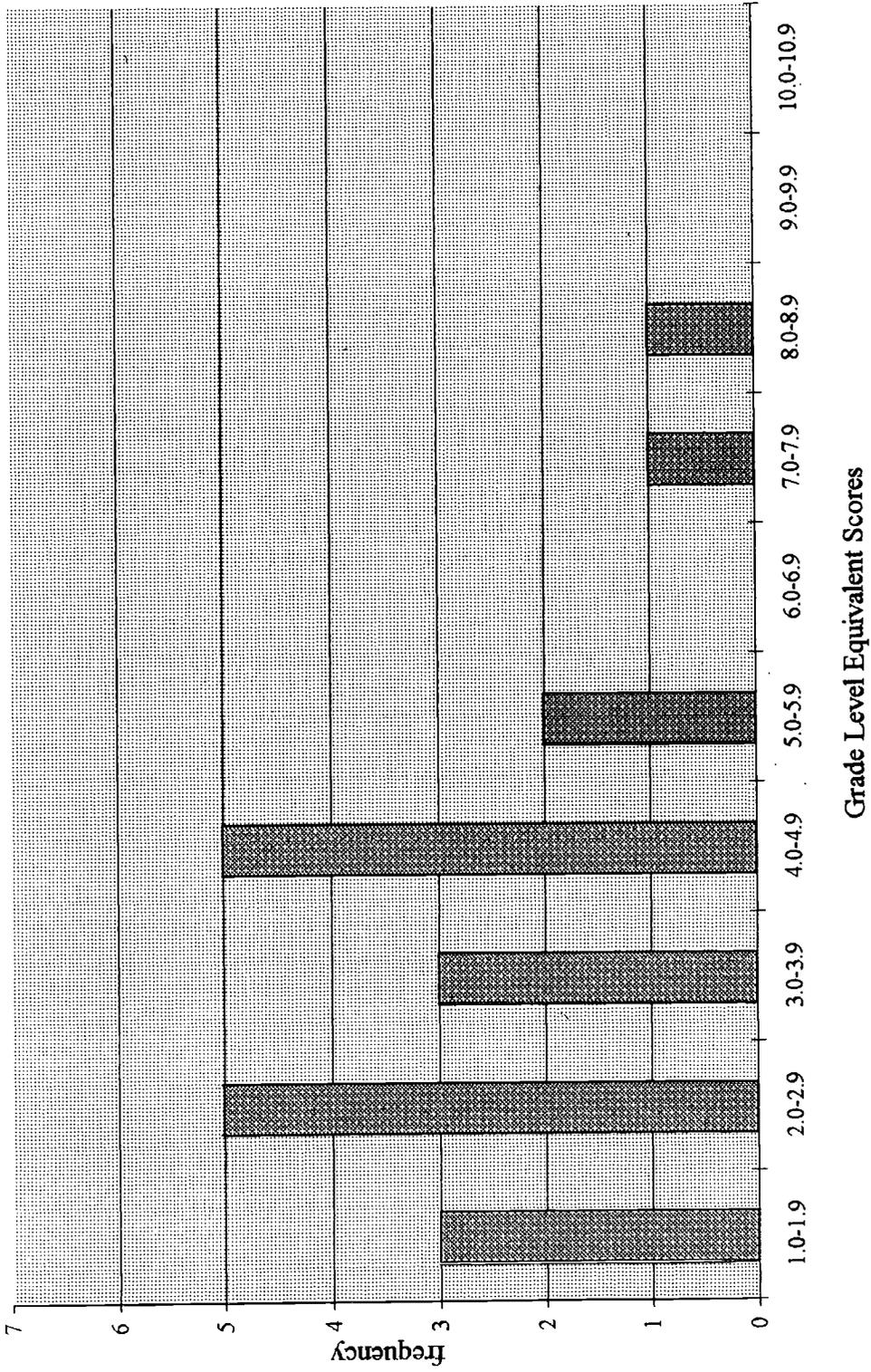


Figure 3. Frequency distribution scores of Stanford Achievement Test, Building 3

Table 1

Baseline Fluency Scores

Building Number	n	Mean	SD
Building 1	25	61.44	35.26
Building 2	20	87.55	30.35
Building 3	22	80	27.65

Probable Causes

Site-based

The researchers prepared a reading attitude survey and gave it to the children prior to the intervention strategy. Sixty-six students were polled on their attitude toward reading. Two styles of questions were used: eight multiple choice and four open-ended (Appendix A).

Table 2

Student Reading Attitude Survey, Section 1 Results, September 1998

Question	Super	OK	Worried	Unhappy
1	30	25	4	6
2	23	25	11	6
3	40	15	5	5
4	45	18	2	0

The first four questions were in regard to the students' feelings about reading. Student responses were generally positive to questions 1, 3, and 4. Of interest was a more mediocre response to question 2, which was "How do you feel when you read out loud?" This indicated to the researchers that fluency was a concern to the students.

Table 3

Student Reading Attitude Survey, Section 2 Results, September 1998

Question	Yes	Sometimes	No
5	45	20	0
6	40	20	5
7	48	10	7
8	37	20	8

Questions 5 through 8 were in regard to attitude. Student responses were somewhat positive, however, 36% of the surveyed students did not like reading. Also noteworthy, 40% did not like getting books as gifts.

Questions 9 through 11 were narrative answers. The questions were:

Who reads to you at home?

How many times a week do you read with someone at home?

How many times a week do you read at home just for fun?

What do you do best at in reading?

Seventy two percent of the students responded that they were read to by their mother or father. The frequency of these shared readings varied in range with higher concentrations at once a week and five times a week. Some children did not respond quantitatively but rather in such terms as a lot, everyday, sometimes, yes, and never.

The reading for fun question yielded an interesting contrast between second and third graders. The third graders from Buildings One and Three responded more favorably to reading

at home for fun. The second graders from Building Two were scattered in their responses with five definite “nevers.”

What the children do best at in reading provided a wide variety of responses. More frequently, they reported that they were good at just reading, reading fast, and sounding out words.

Teacher anecdotal records and observations indicate that fluency is not a taught skill. Teachers generally spend their reading instruction time working on phonics, word attack, comprehension, main idea, sequence, cause and effect, and student reflection and interpretation. Current state goals also include many writing skills which go hand in hand with reading. Consequently, the reading/writing time block is insufficient to cover the aforementioned skills much less reading fluency.

Literature Review

In reviewing the literature, this research team determined that concerns about fluency were more prevalent than they had anticipated. A wide range of articles covered topics such as causes, interventions, and studies that have been done. Three causes reported were lack of instruction, attitude, and lack of reading experiences.

According to Allington (1983), traditional reading instruction has ignored reading fluency as a goal. Without giving children practice and reinforcement in reading fluency (in isolation from other reading skills) they are not going to be developmentally ready for comprehension. When skills are presented in isolation, children are not able to practice fluency. Rasinski, Linek, Padak, and Sturtevant (1994) stated that when words are looked at as single units instead of a whole thought, fluency suffers. Consequently, comprehension is sacrificed because the reader’s mental energy is devoted to decoding the words on the page.

Anderson (1981) called fluency the missing ingredient of reading instruction. Most reading instruction is driven by basal reading programs that do not address reading fluency development, but rather focus on vocabulary building, phonetic skills, and comprehension strategies. These basal programs are used by teachers as self-contained reading systems and as such leave no fluency component in the curriculum (Rasinski et al., 1994). Most teachers do not provide instruction for reading fluency. Focusing attention on comprehension skills (as prescribed by most basal series) may be counter-productive if the component of fluency is not addressed. Also, there is a lack of fluency training in teacher in-service/training seminars (Zutell & Rasinski, 1991).

The absence of fluency instruction may have an important impact on the students' attitude toward reading. Unrewarding reading experiences lead to less involvement in reading related activities (Nathan & Stanovich, 1991). Children avoid reading when they do not feel successful. "Practice is what develops fluency" (Nathan & Stanovich, 1991, p. 178). Lack of practice and a good feeling about reading is the beginning of a cycle of interacting negative consequences (Stanovich, 1986). Struggling readers who avoid practice lose access to knowledge which in turn delays development of other cognitive skills. Schools and societal practices may track non-fluent children in the cycle of negative consequences. Biemiller (1977 – 1978) documented that children in high ability groups have more reading opportunities than children in average ability groups. Children in low ability groups read much less text than children in the other two groups. Consequently, the gap among ability groups widened as the year progressed.

Differences in the amount of reading children do outside the classroom are also linked to fluency. Anderson, Wilson, and Fielding (1988) found that the student at the 50th percentile read

six times as much per day as the student at the 20th percentile. The student at the 80th percentile read over 20 times as much per day as the student at the 20th percentile. These out of school differences in reading become greater over time.

In conclusion, the review of literature cites several probable causes. Primarily, fluency has suffered due to a lack of instruction in this area. Isolating skills draws attention away from fluency. This leads to the second probable cause – students' attitudes toward reading. When fluency suffers, the students' attitudes toward reading will suffer as well. Finally, this turns into the third probable cause – lack of reading experiences. Studies have shown that children in the high reading groups have more opportunities to read than do children in the low reading groups. Quite simply, attaining fluency requires practice and without practice fluency will not be achieved. The gap between high and low ability readers increases. Site-based findings support causes cited in the literature.

CHAPTER 3

THE SOLUTION STRATEGY

Review of Literature: Probable Solutions

Children are experts at becoming experts. Watching them at work or at play, even the untrained observer witnesses the passion that drives the child to develop a skill, understand a concept, or explore something new. Children will repeat, practice, do over and over, and otherwise consume themselves with a task until they get it. With self-motivation in place, the child will give one hundred percent effort toward accomplishing a goal. When confidence and support are added to motivation, then progress begins. This applies in sports, hobbies, as well as reading, writing, and math. When we tap into this enthusiasm and give the learner a plan we position them for success. In light of this, how *does* one get better at reading? Read, read, read, read, read! "If children are to become fluent readers, they need to read a lot" (Nathan & Stanovich, 1991). When children read orally they hear themselves and how they sound. They hear others and compare themselves to what they hear. When they hear themselves read fluently, they identify themselves as readers. When they hear otherwise, they are discouraged. Nathan and Stanovich (1991) state that research in the psychology of reading indicates fluency as a necessary condition for enjoyable reading experiences. They cite lack of practice and difficult material as causes of unrewarding reading experiences. In addition to this, fluency is not taught as a skill in most classrooms. Again, like any sport or skill, reading requires practice and demonstration of technique. The sources consulted for information and research on this problem revealed many adaptable interventions. The following strategies have been proven to increase the reading fluency in young children: repeated reading, paired reading, modeling/oral

previewing, dramatization, neurological impress method, phrase boundary marking, and the fluency development lesson.

Repeated Reading

Samuels (1979) suggested the method of repeated readings. This method prescribes the use of a short passage to be re-read several times until fluency is achieved. The number of words is counted and recorded for each reading until an 85 words-per-minute rate is attained. The students can see their own progress by making a chart, graph, or recordings of their own voice. This self-reflective component augments the students' view of themselves as successful readers and raises their confidence level. Dahl (1979) found that repeated reading significantly increases decoding. He also determined that speed can be increased by 50% and errors cut in half. It is advised to use materials within the students' instructional range. Easier texts lead to more confident and fluent reading (Rasinski & Zutell, 1991). The method of repeated reading is clearly enhanced when the material is not too hard and of high-interest appeal. For example, reading a poem about Halloween during the month of October would be more likely to motivate the reader. Repeated reading gives students the practice they need that is otherwise not afforded to them in conventional reading programs. After four years, second and third grade students in a large city public school increased their California Achievement Test scores on an average of 18 percentile points each year. These students had been using the repeated reading strategy for three to five days a week, 20 – 25 minutes each day (Ihnot, 1998).

Paired Reading

Along with the repeated reading method, Clark (1995) suggests the use of paired readings as a technique for promoting practice in a meaningful, non-threatening way. Children like to work with partners because it makes them feel less isolated, and consequently, more

comfortable, relaxed, and self-assured. According to Swanson (1990) students are paired with partners who have slightly better reading skills. Students take turns reading and asking each other questions. The results are threefold: more oral reading, encouragement for the slower reader, and emphasis on comprehension for both partners. In a 1986 study, Koskien and Blum reported on below average third grade students who participated in a five-week, 45 minutes per week paired reading program. After the five-week period, those students outperformed a group of comparable students who had spent their time on more traditional basal activities. With careful monitoring, this kind of cooperative activity can benefit all students because they learn how to encourage others and become more understanding of differences in classmates.

Modeling/Oral Previewing

Oral previewing uses a model of fluent reading to promote oral reading and comprehension. It is especially recommended when students are reading less than 45 words per minute (Mathes, Simmons, & Davis, 1992). In this strategy, the reader listens and hears how the text should be read before reading it independently. The teacher, a parent, an aide, or a high performance reader may model the fluent reading. This technique may promote more reading growth than unmodeled readings and most certainly gives the students a higher goal for their own practice. Innot (1998) reported that in a four-year study using the teacher modeling component, 45 percent of the Chapter 1 students scored above the 40th percentile in their standardized reading comprehension test. All readers need models of fluent reading in their literacy experiences (Zutell & Rasinski, 1991). Listening to fluent readings of poems, stories, and texts gives the students the appropriate interpretation of the printed words as well as the proper inflections, tone, and pace. It also provides them with an enjoyable reading experience.

Dramatization

Drama is an invaluable tool for educators in the teaching of reading and language in particular (McMaster, 1998). When the dramatization piece is added to the curriculum, the opportunity for repetition and practice is inherent. Students read and reread the pieces they are to perform bringing focus, interest, and confidence to their work (which is play to them!). The use of drama may be in the form of choral reading, readers' theater, short skits, and full stage plays. All of these "are natural entrees into strengthening reading fluency as well as comprehension" (Nathan & Stanovich, 1991, p.181). In her article "Doing literature: Using drama to build literacy", McMaster says:

Much like repeated practice of a piece of music allows a young violinist to develop playing proficiency, repetitious work with a script in drama allows a new reader to develop fluency in reading (p. 578).

Most children love to perform. For those who are reluctant or shy, a simple drama activity is an opportunity to build confidence, to feel important, and to be successful. Hoyt (1992) determined that doing choral reading with third grade Chapter 1 students results in improved fluency.

Neurological Impress Activity

In this activity the teacher and the student sit side by side, with the teacher preferably on the student's dominant side. The book is held jointly between both readers. Reading is done aloud *and* together while tracking the words with the fingers. This allows the student to hear the word just before it is said and to imitate the tone of the language. The pace is increased as the reading moves along and occasionally the teacher lowers her volume to allow the student to lead the reading. A study by Heckelman (1968) indicated average gains of 1.9 grade levels in comprehension for a group of below average readers. The impress method was practiced for 29 days, 15 minutes per day in this study. The neurological impress activity has many benefits for

the beginning reader. Among them are the development of fluency, increased confidence in reading, good modeling, and a pleasant reading experience.

Phrase Boundary Marking

This technique is a simple one and can be used with even the slowest readers. A pencil is used to lightly mark the students' text and then have them read as quickly as they can to the pencil mark (Swanson, 1990). Another variation of this is called "smooshing" (Clark, 1995). In this technique, the teacher demonstrates that there are no vocal breaks between words in oral speech. A story is read with pauses between words and then read again in a fluent way. The difference is obvious. Students are encouraged to "smoosh" the words together when they read, pausing only at punctuation stops. As students practice they begin to understand that words are not read separately but in a connected way, more like oral speaking. The difference is so obvious that the students have fun with it and find the humor to be friendly and encouraging.

Fluency Development Lesson

The fluency development lesson (FDL) was developed by Rasinski, Padak, Linek, and Sturtenant (1994) as a comprehensive approach to address fluency as the neglected goal of reading research and instruction (Allington, 1983). The FDL has seven steps. Selection of texts is based on content, predictability, and rhythm. The steps are as follows:

1. Teacher introduces the text and invites predictions.
2. Teacher models fluent reading by orally reading to the whole class.
3. Teacher leads class in a discussion of the text content and the teacher's oral reading.
4. Teacher guides the whole class in a choral reading.

5. Class is divided into pairs. The text is read three times by each partner and the partners give feedback. This could be done using a form that encourages them to make positive comments about their partner.
6. Teacher invites individuals to read for the class.
7. Text is kept in a folder for independent reading practice.

In this study texts were kept brief (50 – 150 words) and interesting. Reading selections were related to a theme, season, or content being currently studied. These selections could include poems, song lyrics, and passages from narrative. The results from this study of second grade students suggest that instructional approaches for developing fluency, such as the FDL have considerable potential for improving fluency and may deserve a place in the regular reading curriculum.

It was agreed that a combination of the aforementioned strategies would make a comprehensive intervention for attacking the fluency problem in primary students.

Project Objective

As a result of teacher modeling, paired reading, repeated reading, and dramatization during the period of September, 1998 to January, 1999 the targeted second and third grade students will increase their reading fluency as measured by reading fluency assessments and teacher observation.

As a result of teacher modeling, paired reading, repeated reading, and dramatization during the period of September, 1998 to January, 1999 the targeted second and third grade students will increase their positive attitude toward reading as measured by the student survey.

Process Statements

In order to accomplish the terminal objective, the following processes are necessary:

- Fluent reading will be modeled for each new reading selection.
- Students will engage in paired reading.
- Students will use the repeated reading technique with partners and independently.
- Students will be given opportunities to dramatize the reading selections.

Action Plan

I. Materials

- A. Selections to be read will come from a variety of sources in the curriculum.
 - 1. Basal reader
 - 2. Seasonal/theme-related poems
 - 3. Content area studies
- B. All passages will be photo copied for the students.
- C. Student copies will be kept in a collective fashion, with each new page being added to their booklet as the weeks progress.

II. Intervention Strategies

- A. Fluency Modeling – This will be the first step of the intervention process.
 - 1. Teacher will model each reading selection as it is introduced with focus on expression, voice inflection, and fluency.
 - a. This strategy will take place every other week.
 - b. This will be implemented as a whole class activity.
 - c. The teacher will give children their own copy of the reading after the oral reading.
 - d. Children will follow along as the reading is modeled once more.
 - e. The children will keep their copy of the reading in a folder.

- f. This modeling will be a fifteen-minute activity with each new reading selection.
 2. Audio tapes will be used for students who may need additional reinforcement.
 - a. These will be pre-recorded by an adult.
 - b. Listening stations will be set up for use in the classroom.
- B. Paired Reading – This is the second step of the intervention process.
1. The students will read each selection in assigned pairs.
 - a. Teacher will pair students by mixing their abilities.
 - b. Each student will read the text to his or her partner three times.
 - c. The listening partner will tell the reading partner how his/her reading has improved.
 - d. Then the partners will reverse roles.
 - e. Children are encouraged to help each other with challenging words.
 - f. This will be done for fifteen minutes twice weekly.
 2. Children will be encouraged to pair-read during free time with a partner of their choice.
 - a. Choosing his or her own partner is very motivating for the student.
 - b. Frequency of this opportunity will vary from week to week.
- C. Repeated Reading – This is the third step of the intervention process.
1. Children will also have an opportunity each day to read the passage during a fifteen-minute Sustained Silent Reading period.
 2. The goal of this component is to increase the child's phrasing, flow, pace, and confidence with the reading selection.
 3. Children may read with a teacher or an assistant.
 4. Children may read along with the support of an audio tape of the selection.

5. Children will practice the selection independently.
6. Children may record their reading of the selection on an audiotape for self-assessment.

D. Dramatization – This is the fourth step of the intervention process.

1. Children will be encouraged to dramatize the reading in an appropriate way.
2. This will take two fifteen-minute periods during the second week, every other week.
3. Teacher will provide for learning styles by giving choices for this activity.
 - a. Acting out the reading
 - b. Using props
 - c. Creating a mural
 - d. Making a costume
 - e. Working with partners or alone
 - f. Retelling the piece in their own words

III. Methods of Assessment

A. Reading Fluency

1. A base-line fluency test will be done for each student before the intervention begins.
2. A pre-test of each student's fluency performance will be given before teacher models the reading selection. Each student's fluency score will be plotted on a line graph represented by a broken line.
3. A post-test will be given after the four-step intervention process is completed. The students' fluency scores from the post-test will be plotted on a line graph, represented by a solid line.
4. Pre- and post-testing will be repeated approximately every two weeks with each new reading selection.

5. Children will complete a bar graph for their own pre and post-test scores (Appendix B).

B. Students' Attitude Toward Reading

1. Students will be given a Reading Attitude Survey in August to assess their attitudes about reading before the intervention begins (Appendix C).
2. Students will be given the same Reading Attitude Survey in January to assess any changes in their attitudes after the intervention has been completed.

C. Teacher Anecdotal Records and Journals

1. Teacher's anecdotal records will be used to track the students' progress as the intervention steps are implemented.
2. Teacher's journals will be used to reflect on the positive and negative results of the intervention.

CHAPTER 4

PROJECT RESULTS

Historical Description of the Intervention

The practice of repeated reading was used to increase the reading fluency of the targeted second and third grade classes. The intervention for improved reading fluency began in October which was later than the planned start for early September. Getting the surveys completed and recording the baseline fluency scores of words per minute took more time than had been anticipated. Beginning school year activities and schedules factored into the time lag as well as the general getting-acquainted needs of the children and the teachers. This actually did work beneficially because the students felt more at ease with their teachers and the one on one type of procedure that was being used.

The actual number of repeated readings used for the intervention was five. These were introduced, practiced, and dramatized over a period of two to three weeks each. The initial intervention plan was to complete one reading every two weeks but, again, the time allowance for the reading practice did not work out precisely for two weeks. This was due to curriculum demands and the overall time required to sit with each child individually for the readings.

Each reading was selected for seasonal interest and concept/curriculum connection. The selection was at grade level ability which made it easier for some and more difficult for others. This did not present any problems for the purpose of the intervention. The researchers agreed that the students were more nervous at their first attempt of each selection. Body language and serious facial expressions were good indicators for this conclusion. The young readers were very concerned with their scores and how many words they got correct. They had folders for the reading selections as well as a bar graph to color in for beginning and ending results (Appendix

B). They all liked this part because they could record their own progress and see the gains they made. After the practice steps, the second recorded timed reading was much more comfortable for the students. They came to the table with a confident posture, sat down readily, and were anxious to get going. Many children actually jumped up when they knew it was their turn. They knew they were going to read better because of the practice.

The steps used for the intervention were adhered to by the researchers. The modeling piece worked well because the students had to listen to the words. They did not have their copy of the text in front of them for the first oral reading. Partner reading was very popular because they enjoyed helping each other with words and giving feedback to their partner. Less able readers were often paired with better able readers. It must be noted though, that choosing their own partner was more motivating for the children. It was hard to determine if the silent reading was as strong a piece because there was no way of knowing if the students were reading accurately. However, it certainly did not hurt the process. Most favorite of all for the children was the dramatization piece. They were excited about even the simplest kinds of acting out parts and many times got carried away with wanting to make costumes, scenery, and props. There was not time for the use of audiotapes for listening. This was not detrimental to the program. Some children did, however, tape themselves reading instead of listening to a pre-recorded adult and this was very helpful to the young readers.

Presentation and Analysis of the Results

The post intervention fluency scores are listed in Table 4. There were significant gains in the average reading rate for each classroom. The standard deviation once again indicated a considerable number of students scoring above or below the mean.

Table 4

Post-Intervention Fluency Scores

Building Number	n	Mean	SD
Building 1	25	89.6	37.6
Building 2	20	118.6	34.42
Building 3	20	120	29.08

The Student Reading Attitude Survey was given at the end of the project. Sixty-five students were questioned again on their attitude toward reading. The same survey form was used (Appendix C). The survey contained eight multiple choice questions and four open-ended questions. The results are shown in Tables 5 and 6. Questions 1 through 4 reflected students' feelings about reading. Overall, there was an increase in positive responses. Notably, the percentages of students who said they felt "Super" about reading out loud increased from 35% in September to 49% in January.

Questions 5 through 8 were about attitude. The attitudes reported by the students in their survey responses did not significantly change.

Table 5

Student Reading Attitude Survey, Section 1 Results, January 1999

Question	Super	OK	Worried	Unhappy
1	35	21	5	4
2	32	17	12	4
3	35	19	3	8
4	47	14	1	3

Table 6

Student Reading Attitude Survey, Section 2 Results, January 1999

Question	Yes	Sometimes	No
5	46	16	3
6	39	23	3
7	47	12	6
8	39	16	10

Questions 9 through 11 were narrative answers. The questions were:

Who reads to you at home?

How many times a week do you read with someone at home?

How many times a week do you read at home just for fun?

What do you do best at in reading?

Frequency of home reading and the person they read with stayed the same. However, the answers for Question 12 ("What do you do best at in reading?") yielded more specific answers

than the first survey. Forty one percent of the students said they were good at sounding out words or hard words. Twenty six percent reported that they were good at everything.

Conclusions and Recommendations

Using repeated reading to improve students' fluency had a strong impact on the readers' identity as a reader. Overall confidence improved. Enthusiasm was apparent. Words per minute increased by increments of 40 or more words for some children. Questions remaining in the researchers' minds are:

Do repeated readings help with any piece or just the piece being practiced?

In other words, would words per minute be higher on similar reading level selections?

Is the increase due to confidence or decoding or both?

Over a period of time, would the readers be better anyway (based on post intervention scores)?

Even though these questions remain in their minds, the researchers agree that including fluency instruction as a component of a balanced reading program is an effective way to strengthen reading skills overall. The project met all expectations of the researchers. Just as a musician or an athlete would practice a composition or a move over and over, so does the young reader benefit from practicing a selection until it can be read smoothly and accurately. This accomplishes two things: fluency and confidence.

The timings used by the researchers were valued for the purpose of measurement of words per minute. As a regular reading activity it would not be so necessary to pre and post time the readings. The actual reading over and over of a text gives the desired outcome. Also, while the children enjoyed the dramatization segment, it could be a less employed component if time is a factor. But, they sure do enjoy it. The students certainly need some kind of oral practice that is

listened to and the parents or volunteers could participate in that activity. Using peer partners worked very well. Overall, this was a most enjoyable activity for both students and teachers. The researchers enthusiastically plan to use this procedure in their future reading instruction.

Repeated reading is a simple and effective strategy for increasing reading fluency. The researchers would recommend its use, especially for younger readers. It requires no cost but time, and any time spent on better reading is time well spent.

References

- Allington, R.L. (1983). Fluency: The neglected reading goal. The Reading Teacher, 36, 556 – 561.
- Anderson, B. (1981). The missing ingredient: Fluent oral reading. The Elementary School Journal, 81, 173 – 177.
- Anderson, R.C., Wilson, P.T., & Fielding, L.G. (1988). Growth in reading and how children spend their time outside of school. Reading Research Quarterly, 23, 285 – 303.
- Biemiller, A. (1977 – 1978). Relationships between oral reading rates for letters, words, and simple text in the development of reading achievement. Reading Research Quarterly, 13, 223 – 253.
- Blum, I.H. & Koskien, P.S. (1991). Repeated reading: A strategy for enhancing fluency fostering expertise. Theory Into Practice, 30 (3), 195 – 200.
- Breznitz, Z. (1987). Increasing first graders' reading accuracy and comprehension by accelerating their reading rates. Journal of Educational Psychology, 79, 236 – 242.
- Clark, C.H. (1995). Teaching students about reading: A fluency example. Reading Horizons, 35 (3), 250 – 265.
- Collins, J. (1997, October 27). How Johnny should read. Time, 150, 78 – 81.
- Dahl, P.R. (1979). An experimental program for teaching high speed recognition and comprehension skills. In Communications research in learning disabilities and mental retardation. Baltimore: University Park Press.
- Heckelman, R.G. (1968). A neurological impress method of reading instruction. Academic Therapy, 4, 277 – 282.
- Hoyt, L. (1992). Many ways of knowing: Using drama, oral interactions, and the visual arts to enhance reading comprehension. The Reading Teacher, 45 (8), 580 – 584.
- Ihnot, C. (1998). A plan to attack fluency problems. [on-line]. Available: <http://carei.coled.umn.edu/Research Practice/v3 n1/ihnot.html>
- Koskien, P.S. & Blum, I.H. (1986). Paired repeated reading: A classroom strategy for developing fluent reading. The Reading Teacher, 40, 70 – 75.
- Mathes, P.G., Simmons, D.C., & Davis, B.I. (1992). Assisted reading techniques for developing reading fluency. Reading Research and Instruction, 31 (4), 70 – 77.

McMaster, J.C. (1998). "Doing" literature: Using drama to build literacy. The Reading Teacher, 51 (7), 574 – 584.

Mounsteven, J. (1990, Spring). Speed reading: A technique for developing fluent readers. Teaching Exceptional Children, 69 – 71.

Nathan, R.G. & Stanovich, K.E. (1991). The causes and consequences of differences in reading fluency. Theory Into Practice, 30 (3), 176 – 184.

Rasinski, T.V., Linek, W., Padak, N., & Sturtevant, E. (1994). Effects of fluency development on urban second grade readers. Journal of Educational Research, 87 (3), 158 – 165.

Samuels, S.J. (1979). The method of repeated readings. The Reading Teacher, 50 (5) 376 – 381.

School Report Card, Buildings One, Two, and Three (1998).

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in acquisition of literacy. Reading Research Quarterly, 21, 360 – 407.

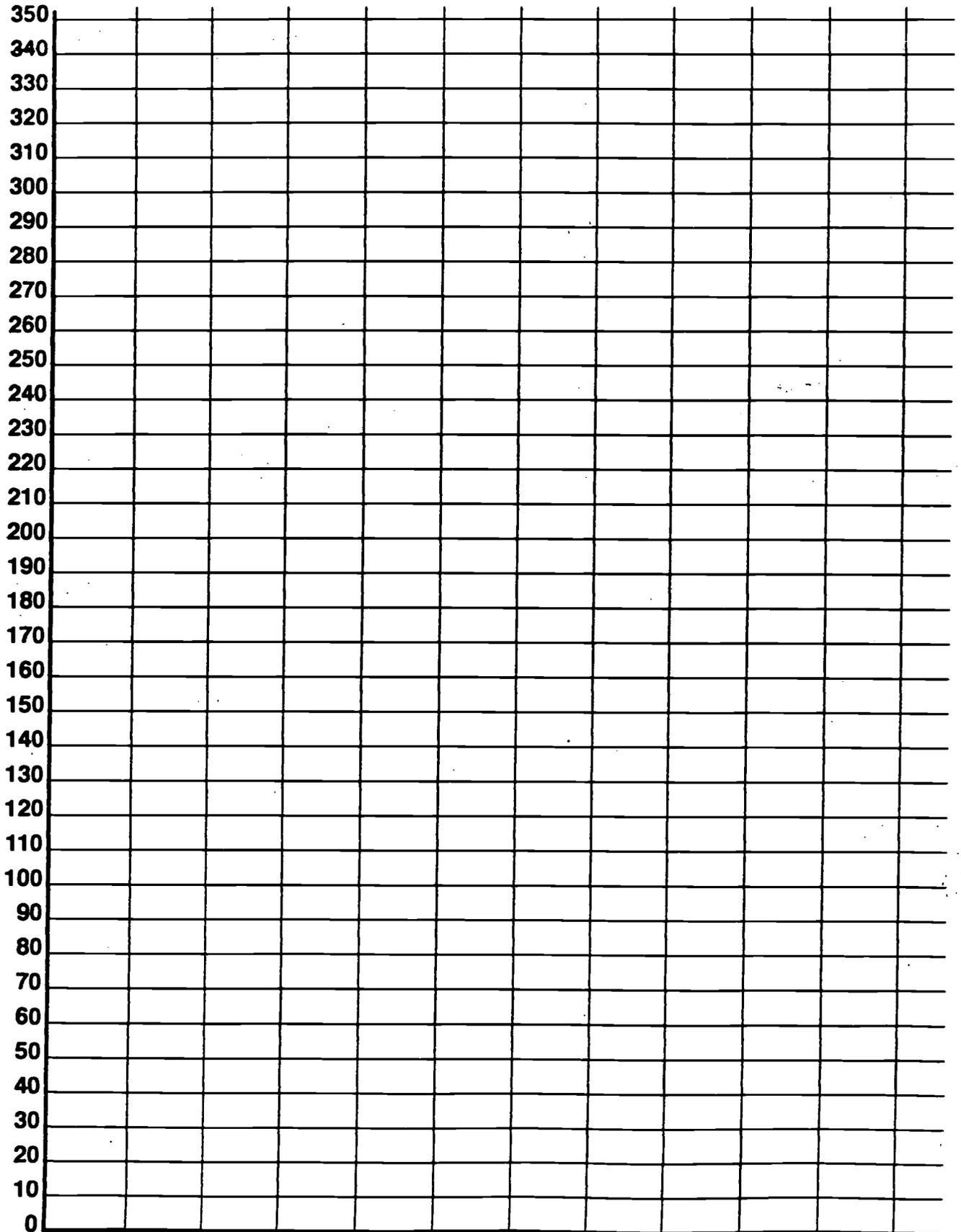
Swanson, B.B. (1990). Reading fluency and the novice reader. Reading Horizons, 30 (4), 266 – 270.

U.S. Department of Commerce. (1990). Selected population and housing characteristics.

U.S. Department of Education, Office of Educational Research. (1986). What works. Washington, D.C.: U.S. Department of Education.

Zutell, J. & Rasinski, T.V. (1991). Training teachers to attend to their students' oral reading fluency. Theory Into Practice, 30 (3), 211 – 217.

Appendix A
Teacher's Pretest/Posttest Recording Sheet



Pretest: _____

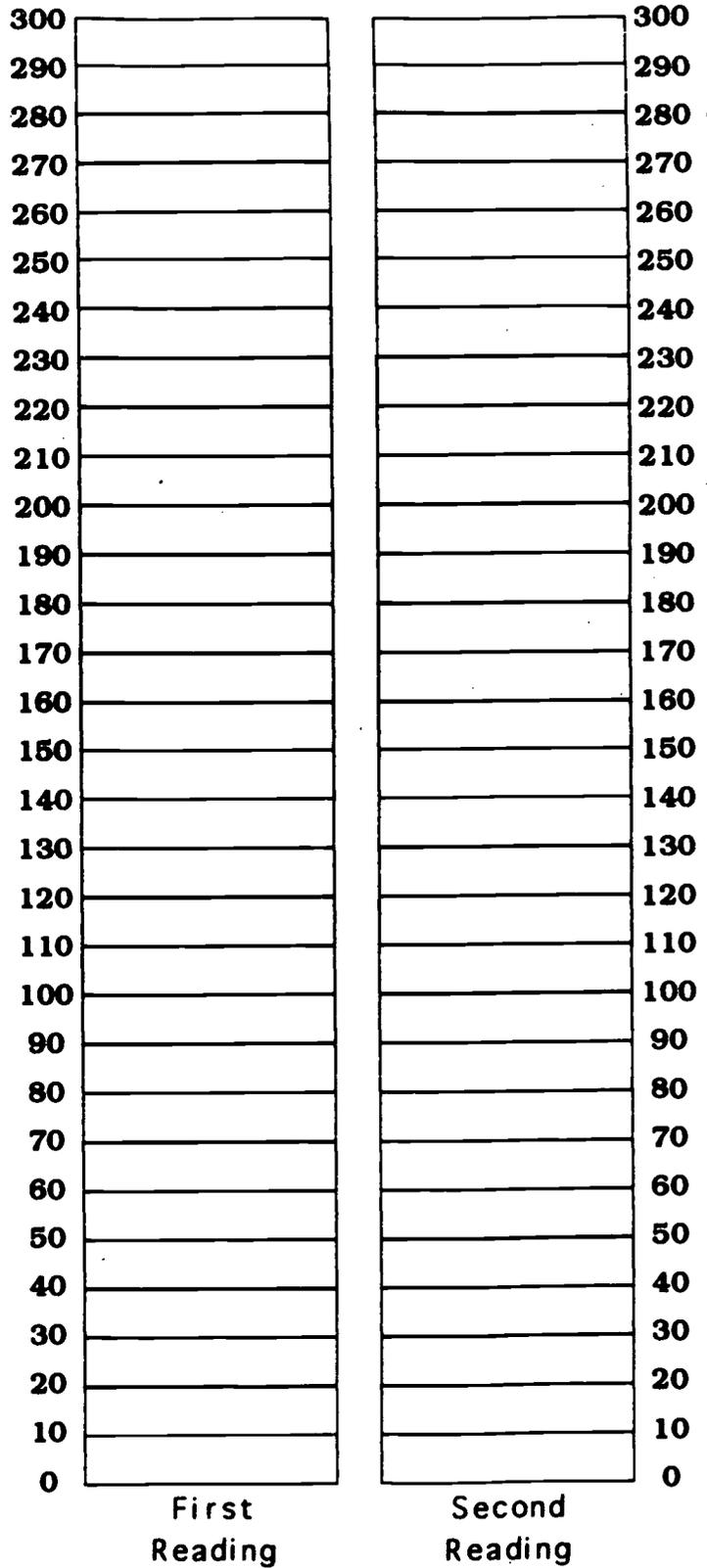
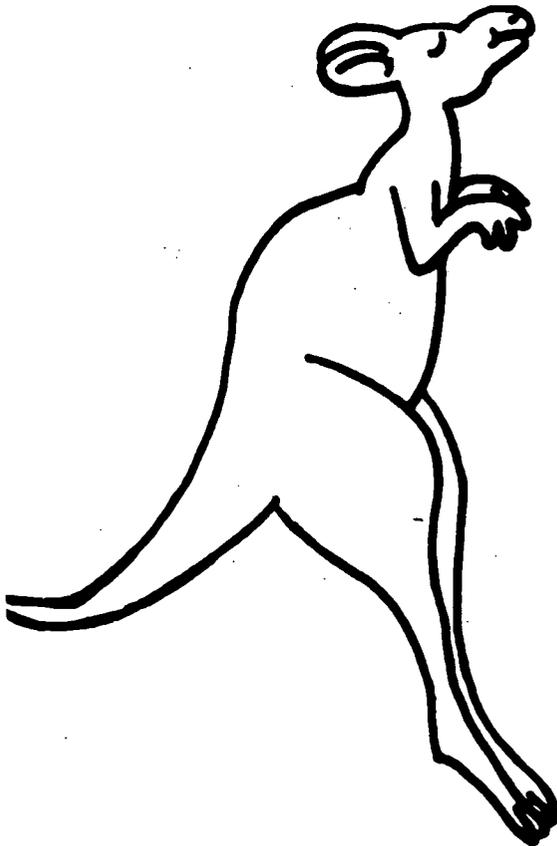
Posttest: _____

Appendix B
Student Pretest/Posttest Graph

NAME: _____

TITLE: _____

Look How
Far I've
Jumped!



Appendix C
Student Reading Attitude Survey

Student Reading Attitude Survey

Name _____ Grade _____ Date _____

Choose the face that tells how you feel.



Super



OK



Worried



Unhappy

1.) How do you feel about reading time at school?



Super



OK



Worried



Unhappy

2.) How do you feel when you read out loud?



Super



OK



Worried



Unhappy

3.) How do you feel about reading during free time?



Super



OK



Worried



Unhappy

4.) How do you feel about yourself when you read?



Super



OK



Worried



Unhappy

Answer YES, SOMETIMES, or NO.

- | | | | |
|---|-----|-----------|----|
| 5.) Are you a good reader? | YES | SOMETIMES | NO |
| 6.) Do you like reading? | YES | SOMETIMES | NO |
| 7.) Do you like to be read to? | YES | SOMETIMES | NO |
| 8.) Do you like getting books as gifts? | YES | SOMETIMES | NO |

Appendix C continued

Write the answers to these questions on the lines below.

9.) Who reads to you at home?

10.) How many times a week do you read with someone at home?

11.) How many times a week do you read at home just for fun?

12.) What do you do best at in reading?



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