

**Evaluation of
Waterford Early Reading Program
Collins Garden and Nelson Elementary Schools
San Antonio, Texas**

School Year 1997-98

**Prepared for
San Antonio Independent School District
San Antonio, Texas**

by

**Research, Assessment & Measurement, Inc.
Baltimore, Maryland**

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EXECUTIVE SUMMARY

In summer 1997, the San Antonio Independent School District (SAISD) received a Reading Improvement Grant to implement a Kindergarten Early Reading Program at Collins Garden and Nelson Elementary Schools. The primary objectives of this program are (1) to help students develop the essential skills they need to become successful readers; (2) to build a strong school-to-parent link; and (3) to provide effective instructional support for teachers. The Waterford Early Reading Program was selected as a vehicle to support and enhance the Kindergarten Early Reading Program because of its capacity to provide flexible, individualized instruction that can be fully integrated into the District's Balanced Literacy Model. The Waterford Program was implemented in four Kindergarten classes at Collins Garden and three at Nelson Elementary in November 1997.

Research, Assessment and Measurement, Inc. (R.A.M.) was contracted to design and implement an independent evaluation of the impact and effectiveness of the Waterford Program in the 1997-98 school year. To provide a framework for this evaluation, R.A.M. formulated the following evaluation questions:

1. To what extent have Kindergarten students participating in the Waterford Program achieved mastery of the following essential skills that children need to succeed at reading?
 - Letter recognition
 - Phonological awareness
 - Understanding print concepts

2. Has the Waterford Program been effective in helping all students develop emergent literacy skills?
3. How does the emergent literacy development profile of students participating in the Waterford Program compare with that of students from another SAISD school without the Program? How does it compare with that of Kindergarten students from Collins Garden and Nelson in the previous year?
4. Has the Waterford Program strengthened the school-parent link? To what extent have parents actively participated in Waterford learning activities with their children at home?
5. What are teachers' reactions to the Program and to the support they have received in implementing it?

To address these questions, R.A.M. collected data from pre- and post-assessment of 114 students (68 at Collins Garden and 46 at Nelson), teacher and parent questionnaires, summary reports from the on-line Waterford School Manager, and meetings and interviews with program staff. Analysis of these data led to the following findings:

- By the end of the school year, students' average correct responses in seven key dimensions of emergent literacy development were impressively high: 94.6 percent in letter recognition, 92.7 percent in letter sound identification, 84.0 percent in rhyming words, 93.2 percent in recognizing initial phonemes, 95.3 percent in understanding concepts about print, 95.7 percent in forming letters, and 100 percent in writing their names.
- The distribution of end-of-the-year achievement measures shows that the vast majority of students have attained high levels of emergent literacy skills: 8 out of 10 students could correctly identify 96-100 percent of upper and lower case letters, generate 6 or more rhyming words for the eight words given, and demonstrate understanding of all 12 concepts about print tested. Nine out of 10 students could

correctly write 48 or more of the 52 letters and identify the initial phonemes in 8 or more of the 10 words tested. Approximately 3 out of 4 students could correctly identify 96 to 100 percent of letter sounds.

- By the end-of-the-year assessment, most students who had scored in the bottom third on the pre-test of letter and letter sound identification had closed the gap dramatically to attain levels of mastery near those of the top third of the class. To accomplish this, the bottom third of the group had to achieve 36 times greater growth than that attained by the top two-thirds in letter recognition and 23 times greater growth in letter sound identification. A very small proportion of students (less than 5 percent) continued to lag far behind the rest in most dimensions of emergent literacy development.
- To develop a comparative measure of Waterford participants' achievement, end-of-the-year assessment data were collected from an elementary school within the SAISD that employs the Balanced Literacy Model but does not have the Waterford Program. Students in the comparison school had significantly lower averages than those at Collins Garden/Nelson in letter identification (86.8 percent and 94.6 percent respectively) and letter sound recognition (79.1 percent and 92.7 percent respectively). It is noteworthy that the proportion of students at Collins Garden/Nelson whose achievement scores in these skills were in the range of 96-100 percent was 1-1/2 times the proportion of students in the comparison school. Students in the comparison school averaged one level lower in Running Record reading scores¹ than those at Collins Garden/Nelson and had a slightly higher average

¹ According to the scale established by the Reading Recovery Program for classifying reading levels up to the first quarter of the 2nd grade.

in reading sight words (16.4 words vs. 15.6). The only available measure for comparing the current year's Kindergarten classes with last year's cohort is end-of-year Running Record reading levels. The average reading level for current classes is 1-1/2 levels higher than that of last year's classes.

- Parent surveys and interviews with teachers and program staff suggest that the Waterford Program has been effective in strengthening the school-parent link. Parent surveys indicate high levels of parent satisfaction with the Program and with children's progress. Parents responded positively to statements about relationships with schools and teachers, and the survey indicates a high level of parental involvement in Waterford learning activities at home. Forty percent of parents reported they watch the Waterford videos with their children three or more times a week, and more than half reported they read the Waterford books with their children three or more times a week. More than 65 percent of parents reported that they review their child's schoolwork three or more times a week, and 40 percent stated they review the child's work six or more times a week. Six of seven teachers surveyed indicated they believe the Waterford Program has increased parents' involvement with their children's learning.
- Teacher questionnaires and conversations with teachers indicate that in general teachers perceive the Waterford Program to be a highly effective instructional tool that provides valuable support to their learning objectives and classroom activities. All of the teachers surveyed indicated they had received adequate training and technical support in the use of the Program, all indicated they felt comfortable with their level of knowledge and ability to work with the Program, and all who expressed

an opinion agreed that the use of the computer's on-line management system has allowed them to tailor instruction to students' individual needs.

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INTRODUCTION AND PROGRAM DESCRIPTION

The San Antonio Independent School District (SAISD) is the sixth largest school district in Texas, with a student population of approximately 61,000. The ethnic background of this population is 83.5 percent Hispanic, 10.9 percent African American, and 5.3 percent White. Approximately 88 percent of students come from low-income families, 7.2 percent have limited English proficiency, and about 44 percent were classified as at-risk students according to a school district report of summer 1997.

In December 1995, a study conducted by the District's Reading Recovery Teachers and the Elementary Restructuring Committee concluded that 91 percent of first grade students were highly at risk of failure in reading. This finding led to the establishment of the 1996-97 Elementary Reading Initiative of the SAISD Improvement Plan. The Initiative called for a Kindergarten program that focuses on the three essential skills that children need to succeed at reading regardless of primary language:

- Automatic letter recognition
- Phonological awareness
- Understanding of print concepts

In summer 1997, SAISD received a Reading Improvement Grant to implement a Kindergarten Early Reading Program in Collins Garden and Nelson Elementary Schools. The primary objectives of this program are (1) to help students develop the essential skills

they need to become successful readers; (2) to build a strong school-to-parent link; and (3) to provide an effective instructional support system for teachers. The Waterford Early Reading Program was selected as a vehicle to support and enhance the Kindergarten Early Reading Program because of its capacity to provide flexible, individualized instruction that can be fully integrated into the District's Balanced Literacy Model. The Program was implemented in four Kindergarten classes at Collins Garden and three at Nelson Elementary in November 1997.

The Waterford program is a balanced approach to reading that combines two major theories of reading: a phonics approach that emphasizes letter names, their corresponding sounds, and patterns of sound, and a meaningful text approach that focuses on the enjoyment and comprehension of literature. The Waterford multi-media learning stations are housed in the classroom and become an integral part of the daily instructional activities as students work with them. Each student works individually at the computer, interacting with a carefully sequenced mix of activities. The software contains more than 910 separate activities, an assessment and management system that allows individualized programming, and take-home materials to support a home-school connection. In addition to books and certificates of achievement that children "write" on the computer, the Waterford program includes books and videotapes for children and parents to use and keep at home.

EVALUATION QUESTIONS

In November 1997 SAISD's administration contracted with Research, Assessment and Measurement, Inc. (R.A.M.) to design and implement an independent evaluation of the impact and effectiveness of the Waterford Program in the 1997-98 school year. In consultation with program administrators, R.A.M. formulated the following evaluation questions:

- I. To what extent have students participating in the Waterford Program achieved mastery of necessary skills in:
 - 1) letter recognition
 - 2) phonological awareness
 - 3) understanding print concepts
- II. Has the program been effective in helping all students develop emergent literacy skills?
- III. How does the literacy development profile of students participating in the Waterford Program compare with that of students from another school without the Program? How does it compare with that of students from Collins Garden and Nelson Elementary Schools in the previous year?
- IV. Has the Waterford Program strengthened the school-parent link? To what extent have parents actively participated in Waterford learning activities with their children at home?
- V. What are teachers' reactions to the Program and to the support they have received in implementing it?

METHODOLOGY

Study Population: A total of 114 students at the two schools (68 at Collins Garden and 46 at Nelson) are included in the study population. The ethnic composition of the study population is 98 percent Hispanic and 2 percent African American. Sixty percent of the students are female and 40 percent are male.

Because of high student mobility in the participating schools, a number of students either withdrew from school before the end-of-year assessments or entered too late in the year for significant exposure to the Waterford Program. For the purpose of this study, we have included only those students who participated in at least two test administrations including the end-of-year assessment. Students who enrolled after the Program was implemented in November are included in the study population if they participated in the mid-year assessment *and* if the end-of-year summary report from the on-line Waterford School Manager showed that the time they had spent on the Waterford computer was not significantly less ($p < .05$) than the average for their class.

Data Collection and Analysis: Data to address the evaluation questions were obtained from the following sources: (1) periodic assessment of students' emergent literacy skills by classroom teachers; (2) parent surveys; (3) teacher surveys; and (4) summary reports from the on-line Waterford School Manager.

In August 1997, January 1998 and May 1998, students were tested in letter recognition and letter sound identification as part of the SAISD's coordinated assessment program. In February and May 1998, additional tests of emergent literacy skills were administered. The schools' regular tests of letter name and letter sound identification, writing names, and forming letters were supplemented by subtests from R.A.M.'s

Emergent Literacy Development Inventory (ELDI) on rhyming words, understanding print concepts, and recognizing initial phonemes.

In addition to these seven dimensions of emergent literacy development, students were tested at the end of the year on their recognition of 25 high-frequency sight words from the Balanced Literacy Assessment Kit and on their oral reading levels using the Running Record assessment and scoring procedures.¹ Students' reading levels were compared with those of last year's Kindergarten students at Collins Garden and Nelson as a partial measure of program effectiveness. An elementary school in the SAISD that employs the Balanced Literacy Model but does not use the Waterford program provided us with data on its Kindergarten students' end-of-year tests of letter recognition, letter sound identification, reading of sight words, and Running Record reading levels. This information was also used for comparison.

A schematic of student subtest administration is provided in **Table 1** on the next page. Procedures for administering each test are described in Appendix A.

¹ Running Record reading level categories are described in Appendix A.

Table 1. Test Administration Schedule

| Subtest | Aug. 1997 | Jan/Feb. 1998 | May 1998 |
|--|----------------------|--------------------------|---------------------|
| 1. Write first name | | X | X |
| 2. Identify capital and lower case letters | X | X | X |
| 3. Identify letter sounds | X | X | X |
| 4. Rhyme words | | X | X |
| 5. Recognize initial phonemes | | | X |
| 6. Understand concepts about print | | X | X |
| 7. Form upper and lower case letters | | | X |
| 8. Read sight words | | | X |
| 9. Reading level | | | X |

In addition to scores obtained from student assessment, R.A.M. collected reports of each student's "time on task" in February and May 1998 from the on-line Waterford School Manager. Data from these multiple sources were compiled to construct a profile of Waterford participants' emergent literacy development. In May, questionnaires were administered to parents and teachers to elicit their perceptions of the program and gauge the extent of parents' involvement in Waterford learning activities at home.

FINDINGS

I. To what extent have students participating in the Waterford Program achieved mastery of the necessary emergent literacy skills?

Table 2 on the next page presents Waterford participants' average percent correct responses at the end of the year for all skills assessed. As the table illustrates, averages in all seven dimensions of emergent literacy development are impressively high. The average student can write his/her name (100 percent); can correctly identify 94.6 percent of letters and 92.7 percent of letter sounds; can find words that rhyme with given words 7 out of 8 times (84 percent); can recognize 9 out of 10 initial phonemes (93.2 percent); understands 11 of the 12 concepts about print tested (95.3 percent); and can form 95.7 percent of letters.

Table 2. Waterford Participants' End-of-Year Average Percent Correct Responses for All Skills Tested: Collins Garden and Nelson Elementary Schools

| Skill | N | Average Percent Correct |
|--|----------|--------------------------------|
| 1. Write first name | 114 | 100 |
| 2. Identify capital and lower case letters | 114 | 94.6* |
| 3. Identify letter sounds | 114 | 92.7* |
| 4. Rhyming words | 114 | 84.0 |
| 5. Recognize initial phonemes | 114 | 93.2 |
| 6. Understand concepts about print | 114 | 95.3 |
| 7. Form upper and lower case letters | 114 | 95.7 |
| 8. Read sight words (25 words) | 113 | 62.2 |
| 9. Reading level | 114 | 3.8** |

*Some classes tested on 54 upper and lower case letters, including the “printer’s a and g,” while others tested on 52 letters. Some classes tested letter sounds on 52 letters and others on 26. Consequently, percent correct responses were computed rather than the number of letters correctly identified.

**Average reading level is computed by assigning the following numeric value to each student’s Running Record reading level score: A-B = 1; 1-2 = 2; 3-4 = 3; 5-6 = 4, etc.

To determine the extent of growth these averages represent, we compared them with average skill levels at the beginning and midpoint of the school year. **Table 3** on the next page shows the growth in average percent correct responses for each of the five skills

that were tested more than once during the year. As the table illustrates, students demonstrated growth between tests in all five skill areas. Data are available for measuring change over the course of the entire school year in only two areas: letter recognition and letter sound identification. Students' growth in these two areas is particularly noteworthy.

Table 3. Waterford Participants' Growth in Average Percent Correct Responses: Collins Garden and Nelson Elementary Schools

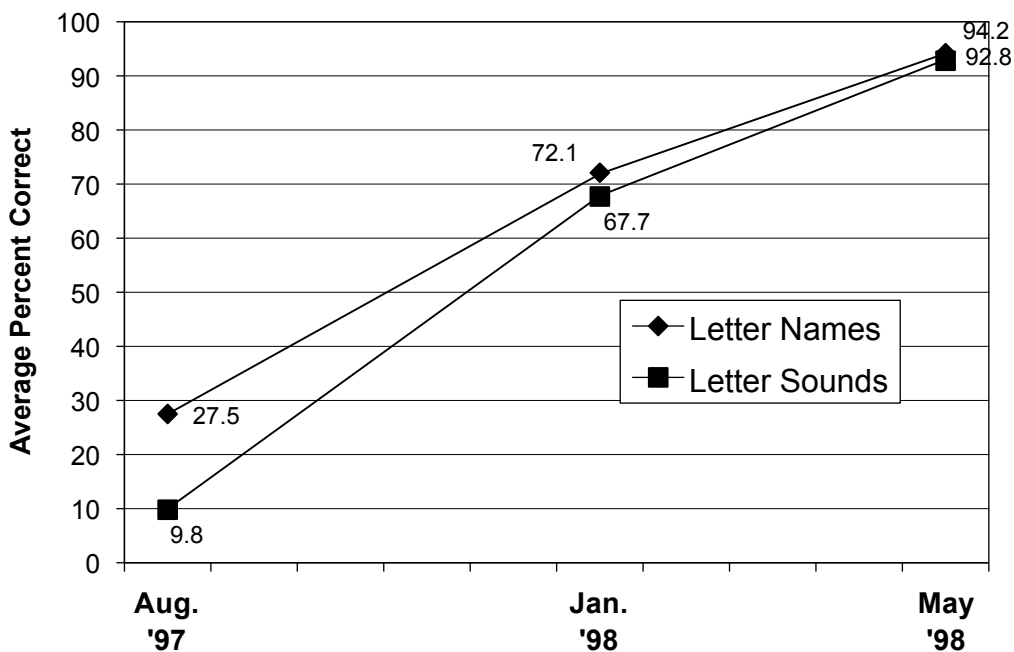
| Skill | N* | Aug. 1997 | Jan/Feb. 1998 | May 1998 | % Change |
|---|-----------|------------------|----------------------|-----------------|-----------------|
| Write first name | 98 | | 94.9 | 100 | 5% |
| Identify capital and lower case letters | 103 | 27.5 | 72.1 | 94.2 | 243% |
| Identify letter sounds | 104 | 9.8 | 67.7 | 92.8 | 847% |
| Rhyme words | 110 | | 57.7 | 84.4 | 46% |
| Understand concepts about print | 113 | | 91.8 | 95.9 | 25%** |

*N = number of students tested. The table includes only students who participated in all test administrations for the skill being tested.

**Students were tested in their understanding of 10 key concepts about print in February 1998 and 12 concepts (2 additional ones) in May. The percent change is adjusted to reflect this increase.

The extent of Waterford participants' growth in letter and letter sound identification is graphically illustrated in **Fig. 1** below, which shows the average percent correct responses for each of the three test periods. Fall test results indicate that most children had little previous knowledge of letters and letter sounds, averaging 27.5 percent correct in letter identification and a much lower 9.8 percent correct in letter sounds. By the end of the school year their letter recognition skills had grown by approximately 3-1/2 times to reach an average of 94.2 percent correct, and their ability to correctly identify letter sounds had become 9-1/2 times greater, reaching an average of 92.8 percent.

Fig. 1
Letter Name and Letter Sound Identification:
Waterford Participants' Growth in Average Percent Correct Responses
Collins Garden and Nelson (N = 104)



II. Has the program been effective in helping all students develop emergent literacy skills?

While students' end-of-year average scores present an impressive picture of growth and achievement, averages often provide limited information and may blur or even conceal the full dynamics of student achievement. In **Figs. 2-7** that follow, we present the distribution of end-of-year scores for the seven emergent literacy skills tested. As this distribution indicates, all but a small proportion of students have attained high levels of these skills.

Letter Recognition

A critical first step in literacy development is recognition of letters. Some researchers suggest that a child's knowledge of phonemes and letter names in the language best predicts that child's future reading success. **By the end of the school year, approximately 8 out of 10 students (78.9 percent) could correctly identify 96 to 100 percent of upper and lower case letters.**

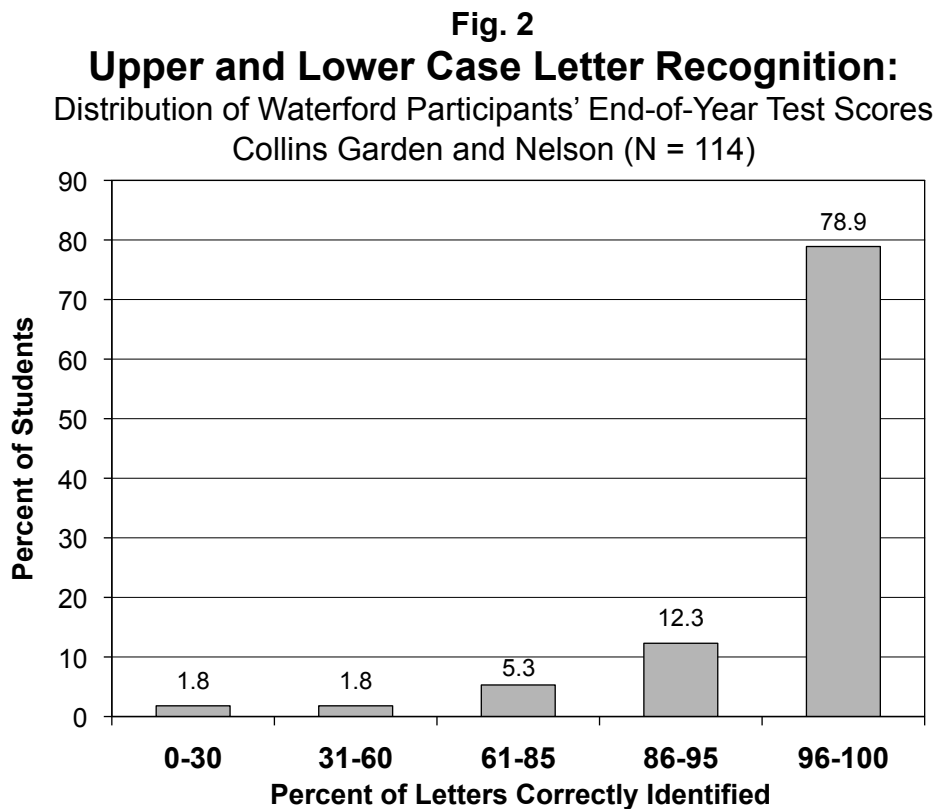


Fig. 2 shows that 1.8 percent of students could identify 0-30 percent of letters (16 or fewer out of 52) and 78.9 percent of students knew almost all of the letters (50 or more out of 52).

Letter Sound Identification

The recognition and formation of letter sounds is considered key to initial decoding of words. At the end of the school year, approximately 3 out of 4 students (73.7 percent) could correctly identify 96 to 100 percent of the letter sounds.

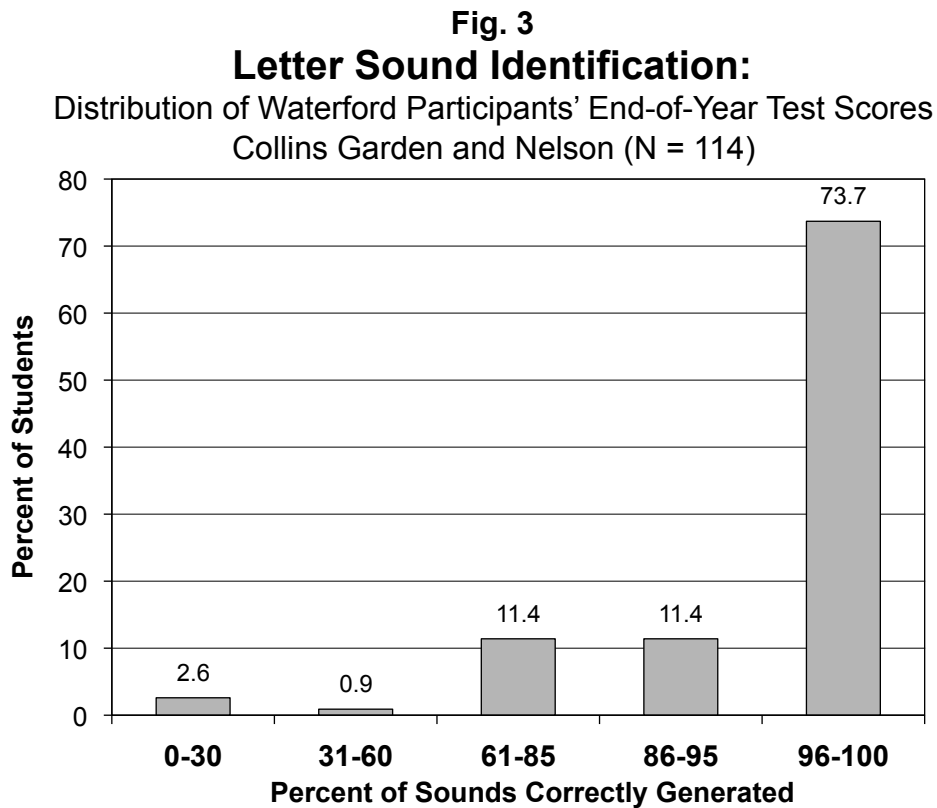


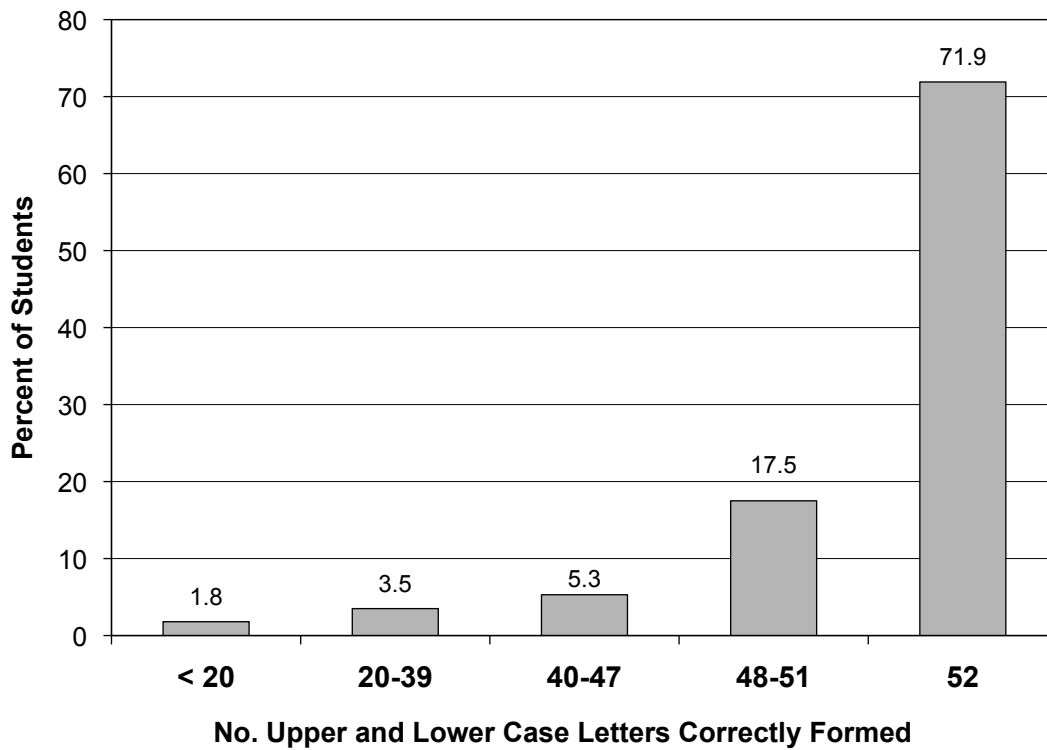
Fig. 3 shows that 2.6 percent of students could correctly identify between 0 and 30 percent of letter sounds (16 or fewer out of 52), while 73.7 percent correctly identified 96-100 percent (50 or more out of 52).

Forming Letters and Writing First Names

Learning how to form letters is a critical step in developing the connection between reading and writing, and writing one’s own name is a natural extension of forming letters that reinforces and personalizes using letters. End-of-year assessment results show that **71.9 percent of students could write all 52 upper and lower case letters correctly and approximately 90 percent could correctly write 48 or more letters (sum of the two columns at right). Moreover, 100 percent of students could correctly write their first names (see Table 2).**

Fig. 4
Letter Formation:

Distribution of Waterford Participants’ End-of-Year Test Scores
Collins Garden and Nelson (N = 114)

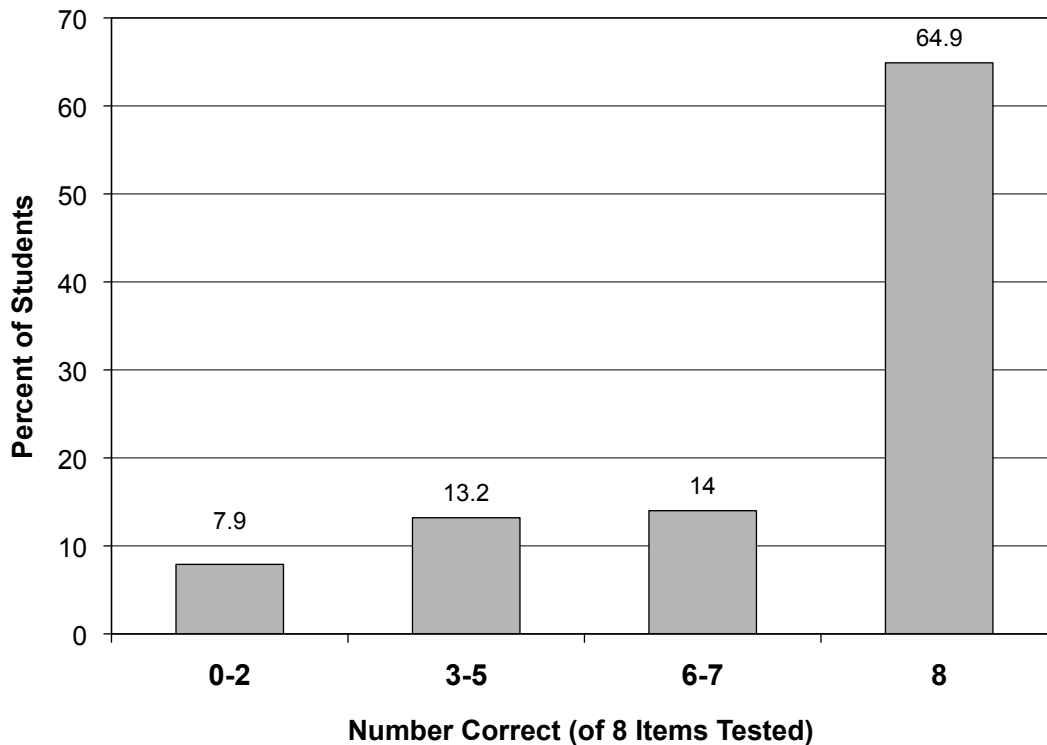


Rhyming Words

Recognizing words that rhyme and word sound patterns is essential to linguistic development. Test results at the end of the school year show that **close to 2/3 of the students (64.9 percent) could successfully provide words that would rhyme with each of the eight words given. Eight out of ten students (78.9 percent) could generate 6 or more rhyming words for the eight words given (sum of the two columns at right in the graph below).**

Fig. 5
Rhyming Words:

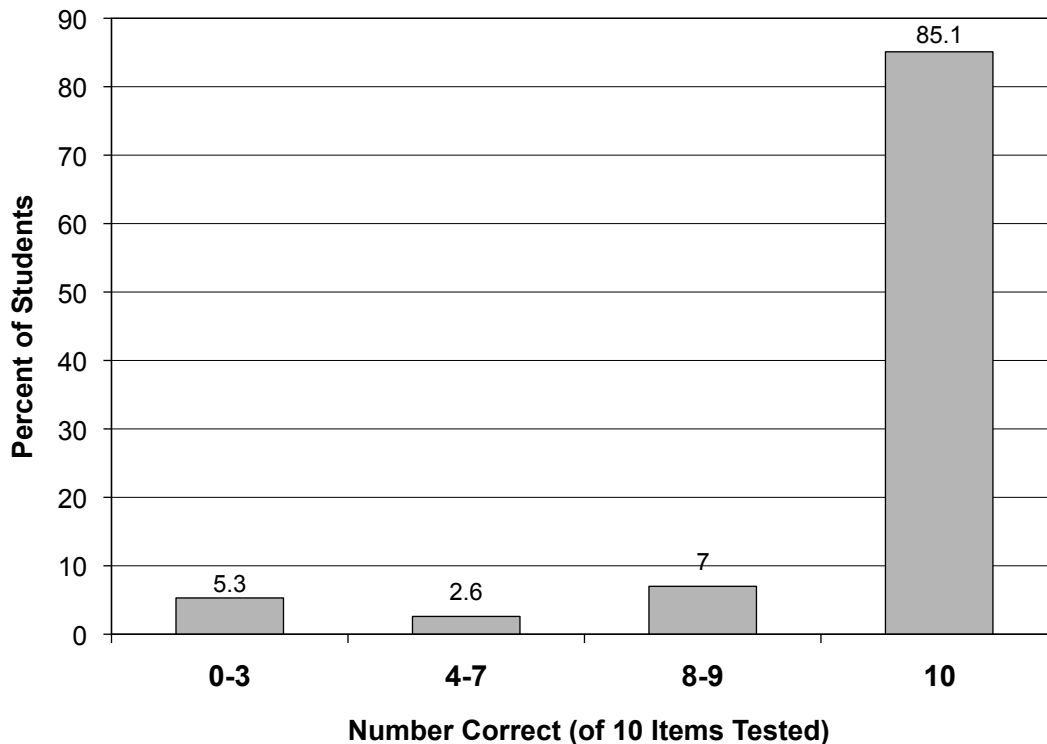
Distribution of Waterford Participants' End-of-Year Test Scores
Collins Garden and Nelson (N = 114)



Recognizing Initial Phonemes

A large body of research suggests that children’s level of phonemic awareness on entering school is a powerful determinant of their success in learning to read. End-of-year assessment results show that **85 percent of students could correctly identify the initial phonemes in all of the ten words tested. Nine out of ten students (92.1 percent) could correctly identify the initial phonemes of 8 or more of the 10 words tested.**

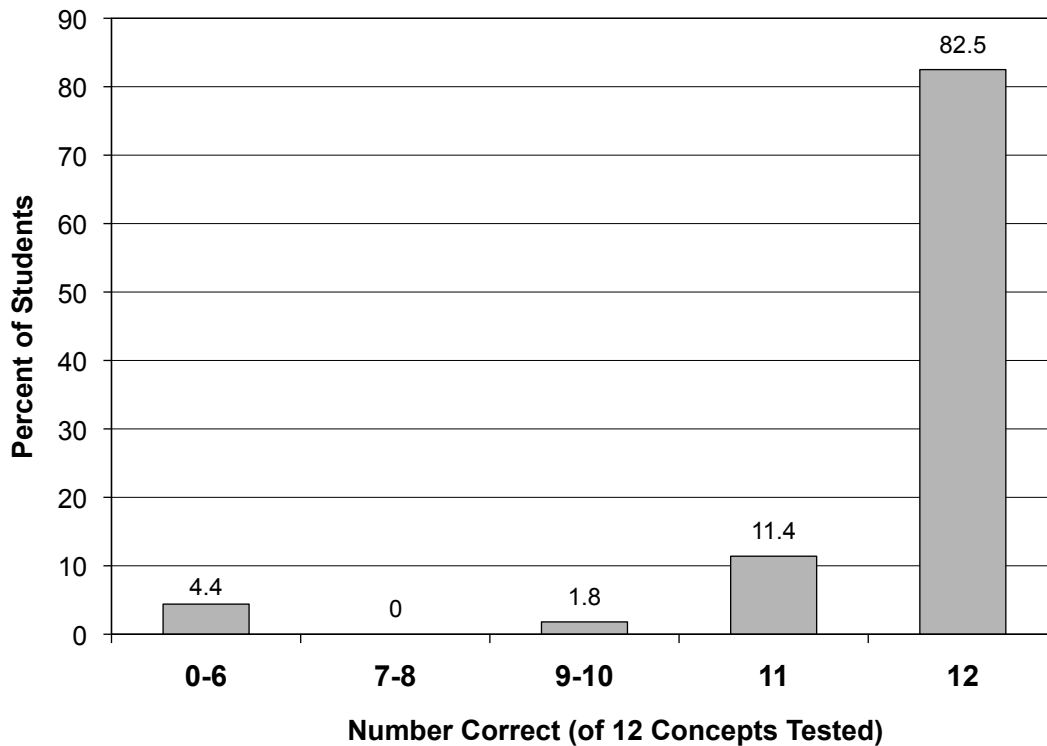
Fig. 6
Recognizing Initial Phonemes:
Distribution of Waterford Participants’ End-of-Year Test Scores
Collins Garden and Nelson (N = 114)



Understanding Concepts About Print

Concepts about print have proved to be a sensitive indicator of one group of emergent literacy behaviors that support reading acquisition. End-of-year assessment showed that **82.5 percent of students understood all of the 12 concepts about print that were tested and 94 percent understood 11 or more concepts (sum of the two columns at right in the graph below).**

Fig. 7
Understanding Print Concepts:
Distribution of Waterford Participants' End-of-Year Test Scores
Collins Garden and Nelson (N = 114)



To further understand the impact of the program on all students, we investigated its differential impact on students who began the school year with varying levels of skill development. In **Figs. 8 and 9** on the next page, we compare the growth of students who initially tested in the bottom one-third of the group in letter recognition with that of students who tested in the top two-thirds. **Fig. 8** illustrates that at the fall 1997 test, the top two-thirds knew 24 times more letters than the bottom third (41.1 percent correct vs. 1.7 percent). By the mid-year test, the top two-thirds knew slightly fewer than twice as many letters (86.9 percent vs. 44.7 percent), and by the end of the year the bottom third averaged fairly close to the top two-thirds, with both groups showing respectably high levels of skills (86.8 and 98.8 percent respectively). A comparison of the two groups' growth patterns in letter sound identification (**Fig. 9**) presents a similar picture. In both cases, the growth of the lower third has been far greater than the top third (36 times greater in letter identification and 23 times greater in letter sounds).

Fig. 8
Letter Recognition:
 Average Growth of Waterford Participants Pre-testing in the Bottom Third vs. Those Pre-testing in the Top Two-Thirds (N = 103)

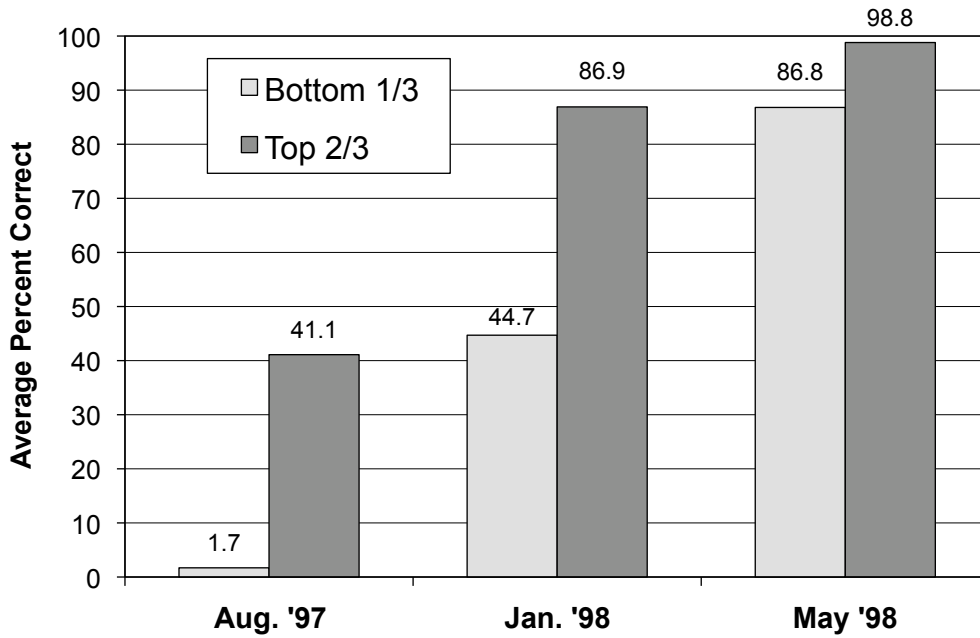
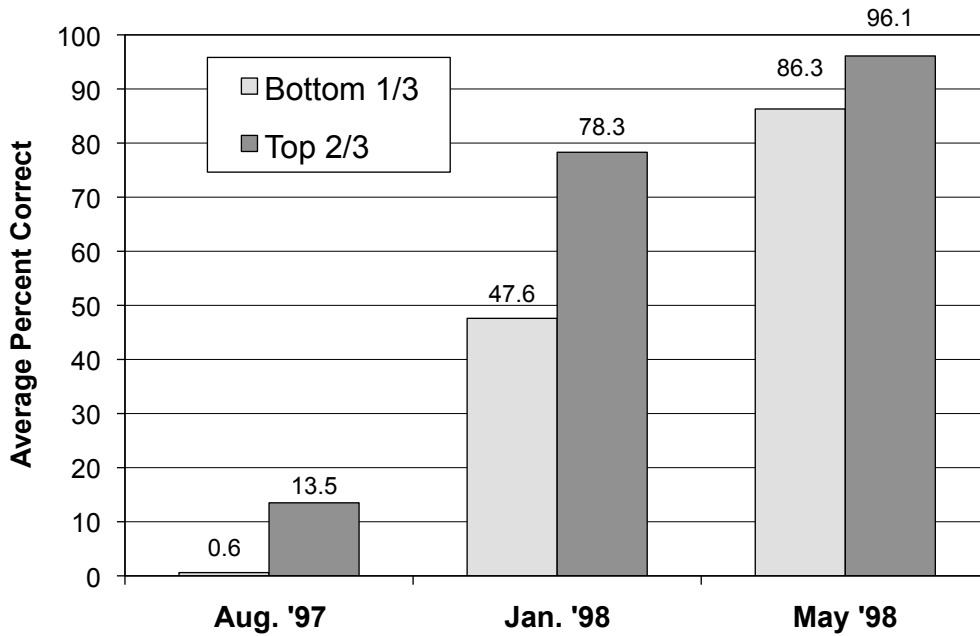


Fig. 9
Letter Sound Identification:
 Average Growth of Waterford Participants Pre-testing in the Bottom Third vs. Those Pre-testing in the Top Two-Thirds (N = 103)



IIIA. How does the literacy development profile of students in the Waterford Program compare with that of students from another school without the Program?

To develop a comparative measure of Waterford participants’ achievement, we requested data on assessment of Kindergarten students from an elementary school in the SAISD that uses the Balanced Literacy Model but does not use the Waterford Program. Achievement measures were provided on students’ end-of-year letter recognition, letter sound identification, reading of sight words, and Running Record reading levels. In both letter recognition and letter sound identification (**Table 4** below), the average percent correct for students at Collins Garden and Nelson was significantly higher ($p < .01$) than for those in the comparison school (94.6 percent vs. 86.8 percent in letter identification and 92.7 percent vs. 79.1 percent in letter sounds). Moreover, as shown in **Figs. 10 and 11**, the proportion of students who had mastered all or nearly all of the letters and sounds was significantly greater ($p < .01$) at Collins Garden and Nelson than at the comparison school. **Fig. 10** shows that 78.9 percent of students at Collins Garden/Nelson could identify 96-100 percent of the letters, compared to 62.9 percent in the comparison school. In letter sounds (**Fig. 11**), the difference between the two groups was even more pronounced: 73.7 percent of students at Collins Garden and Nelson knew 96-100 percent

Table 4. End-of-Year Achievement Measures, Waterford Participants at Collins Garden/Nelson vs. Comparison School

| Skill | Waterford-CG/N (N = 114) | Comparison School (N = 97) | Significant at $p < .01$ |
|-------------------------------|-------------------------------------|---------------------------------------|---|
| Letter I.D. (percent correct) | 94.6 | 86.8 | Yes |
| Letter sound I.D. (“ ”) | 92.7 | 79.1 | Yes |
| Avg. sight words read (of 25) | 15.5 | 16.4 | No |
| Avg. reading level | 3.8 | 2.7 | Yes |

Fig. 10
Upper and Lower Case Letter Recognition:
 End-of-Year Scores for Waterford Participants at Collins Garden/Nelson (N = 114) vs. Comparison School (N = 97)

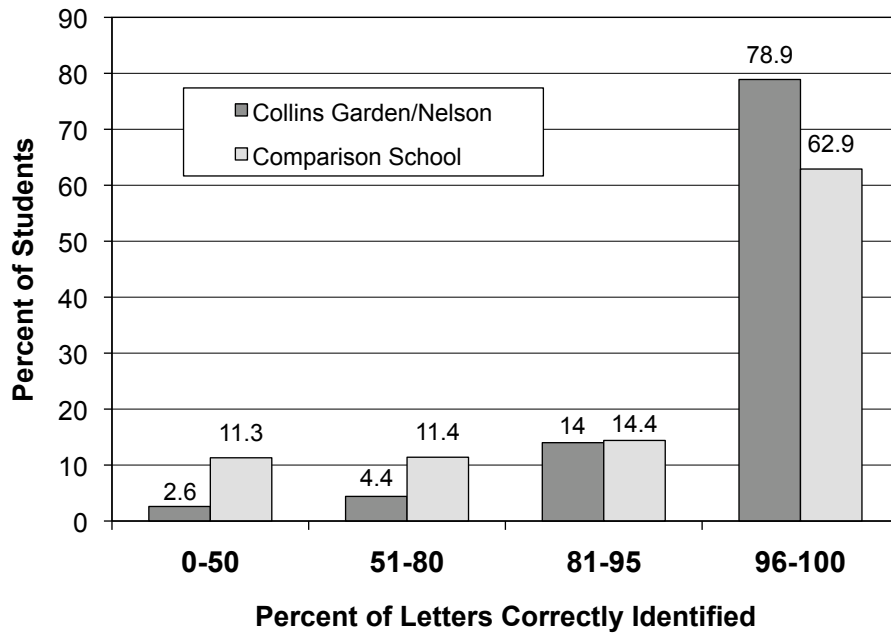
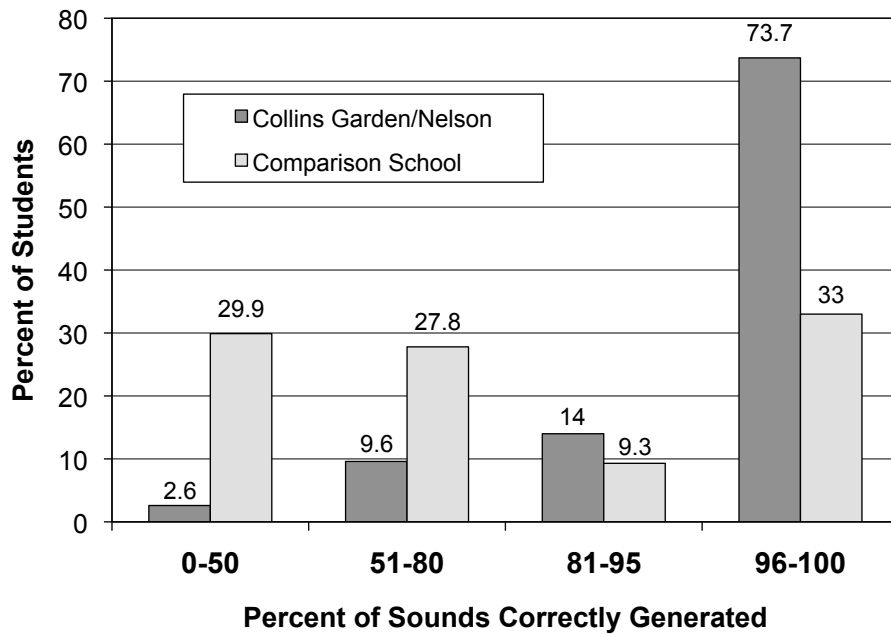


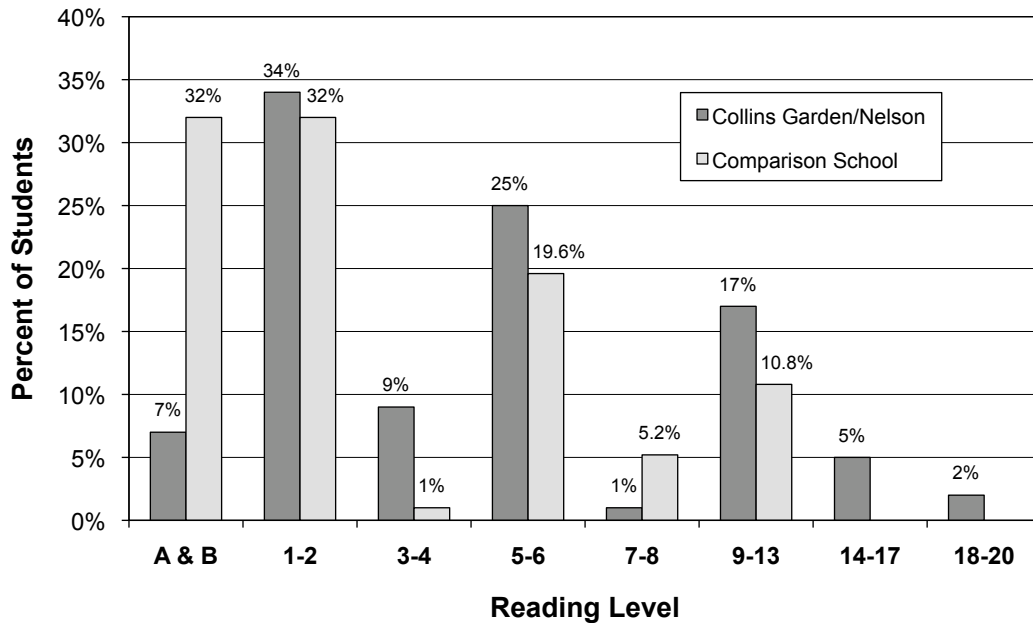
Fig. 11
Letter Sound Identification:
 End-of-Year Scores for Waterford Participants at Collins Garden/Nelson (N = 114) vs. Comparison School (N = 97)



of the letter sounds, compared with 33 percent of students in the comparison school.

While formal reading is not an educational objective of the SAISD’s Kindergarten program, students’ Running Record reading levels and recognition of high-frequency sight words are routinely assessed at the end of the Kindergarten year to facilitate programmatic design for entering first graders. **Fig. 12** below illustrates the distribution of end-of-year reading level categories¹ for Waterford participants at Collins Garden/Nelson and for students at the comparison school. The figure shows that the proportion of comparison school students in the lowest reading level (A and B) was more than four times greater than that at Collins Garden/Nelson (32 percent vs. 7 percent). While 50 percent of students at Collins Garden/Nelson scored at levels 5-6 and above (sum of the rightmost

Fig. 12
End-of-Year Reading Levels:
 Waterford Participants at Collins Garden/Nelson (N = 114) vs.
 Comparison School (N = 97)



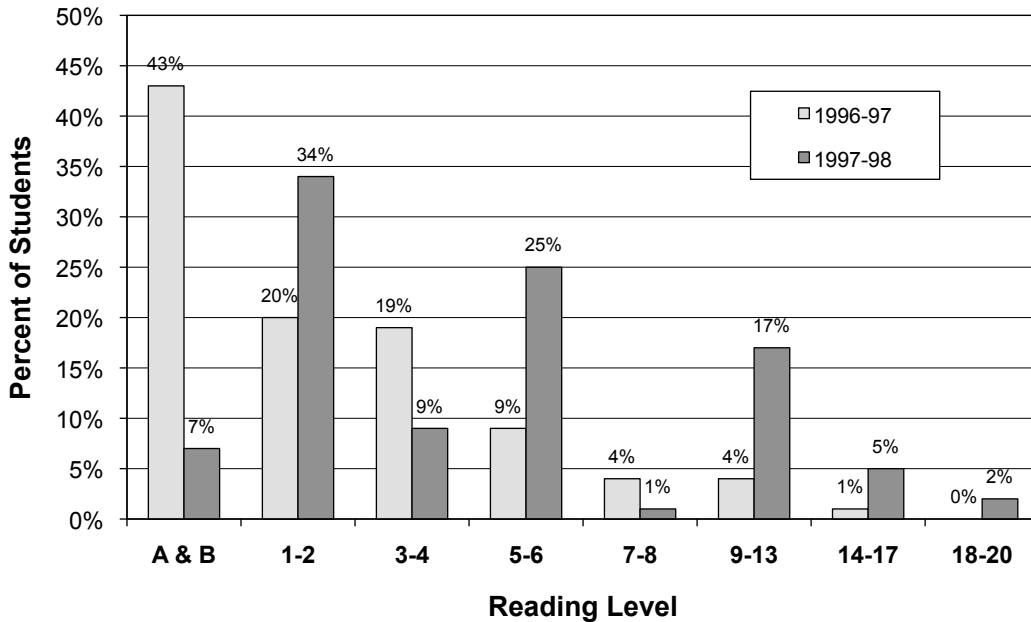
¹ An explanation of Running Record reading level categories is presented in Appendix A.

five columns), 36 percent of students at the comparison school scored at these levels. The average reading level of 3.8 for students at Collins Garden/Nelson was significantly higher ($p < .01$) than the average of 2.7 for students at the comparison school. Students at the comparison school performed slightly better at recognizing high-frequency sight words, averaging 16.4 words out of 25 to 15.5 words for students at Collins Garden/Nelson (Table 4). The difference between these two averages is not statistically significant.

IIIB. How does the emergent literacy development of students participating in the Waterford Program compare with that of previous Kindergarten classes at Collins Garden and Nelson?

The only measure available to us for comparing Waterford participants' performance with that of previous Kindergarten classes at Collins Garden and Nelson is Running Record reading levels. Fig. 13 on the following page compares the distribution of reading level scores for this year's classes (1997-98) with that of the previous year's classes (1996-97). The figure shows noticeable improvement in reading performance this year, with a general shift toward the higher reading level categories. While the proportion of this year's students scoring in the lowest reading category (A and B) is less than one-sixth that of last year's students (7 percent vs. 43 percent), almost three times as many students in this year's classes scored at the 5-6 level and above (50 percent vs. 18 percent for last year's classes). The average reading level of 3.8 for this year's classes is significantly higher ($p < .01$) than the average of 2.3 for the previous year's classes.

Fig. 13
End-of-Year Reading Levels:
 Comparison of 1997-98 Kindergarten Classes (N = 114) with Classes
 of 1996-97 (N = 138), Collins Garden and Nelson



IV. Has the Waterford program strengthened the school-parent link? To what extent have parents actively participated in Waterford learning activities with their children at home?

The Waterford program is designed to strengthen the school-parent link in several ways. First, by participating in Waterford learning activities with children at home, parents become more familiar with what their children are learning in school and can discover new ways of stimulating their children’s learning outside of the classroom. Secondly, children bring home books they have made on the computer and certificates of achievement that keep parents apprised of their progress and accomplishments. Finally, the on-line Waterford School Manager can help teachers identify children’s individual learning needs and communicate their progress to parents.

In fall 1997, both Collins Garden and Nelson Elementary Schools held meetings and conferences with parents to introduce the Waterford program and orient parents to the take-home materials. In May 1998, parents were surveyed to elicit their reactions to the program and determine the extent to which parents and children are using the Waterford materials at home. A 13-item questionnaire was distributed and collected by teachers in each Waterford class. The survey contained 12 evaluative statements related to the Waterford program and the relationship between parents and school, with responses arranged on a 3-point Likert scale. An additional five items were designed to determine the level of parents' participation in Waterford learning activities with their children at home. The response rate was high, with 101 parents returning questionnaires. Responses to each survey item are presented in Appendix B. The following is a summary of survey findings.

More than 9 out of 10 parents expressed positive opinions about the learning benefits of the Waterford Program.

- Almost all parents (97-98 percent) agreed that working on the computer at school and reading the Waterford books at home help their children learn.
- 97 percent of parents agreed that the books and videos help them work with their children at home.
- 9 out of 10 agreed that watching the videos at home helps their children learn, and 9 out of 10 who have other children in the household agreed that the books and videos also benefit these children.

A large majority of parents expressed positive attitudes toward their relationships with schools and teachers.

- 85 percent indicated they feel they can talk freely about their concerns with their child's teacher, 88 percent indicated that they feel comfortable and welcome when they visit the school, and 88 percent indicated that their child's teacher keeps them fully informed about the child's learning.
- 84 percent indicated their child comes home eager to share what she/he has learned at school.
- 96 percent indicated their child is proud of the booklets she/he prints with the computer.
- 98 percent indicated satisfaction with their children's progress in school.
- 84 percent agreed that they had received help from the school in using the Waterford materials. A small proportion (8 percent) disagreed and another 8 percent responded that they were "not sure."

In general, parents reported a high degree of participation in Waterford learning activities at home.

- 40 percent reported they watch the Waterford videos with their children three or more times a week.
- More than half reported they read the Waterford books with their children three or more times a week.
- More than 65 percent reported they review their children's school work three or more times a week, and 40 percent stated they review the child's work six or more times a week.

The questionnaire also contained a section for parents to comment on their impressions of the Waterford program. Thirty-eight parents wrote comments, of which the vast majority were positive and enthusiastic. All comments are presented in Appendix

B. Parents commented positively on the following aspects of the program:

- Satisfaction with children's progress and/or the learning benefits of the program (19 comments)
- Parents and children's enjoyment of the videos and books (11 comments)
- Benefits of take-home materials to other children in the household (8 comments)
- Program makes learning easier and more enjoyable (5 comments)
- Program stimulates children's interest in computers and/or helps them gain basic computer knowledge (2 comments)
- Program helps children learn about different cultures (1 comment)
- Books and videos encourage parent involvement in children's learning (1 comment)

Three parents made negative comments, which were related to the following aspects of the program:

- Pace of the videos is too slow to hold the child's attention (1 comment)
- Songs in other languages are confusing to children who have recently learned English (1 comment)
- Child did not find the videos challenging enough (1 comment)

In addition to these evaluative comments, one or two parents indicated on the questionnaire that they did not have either the videos or VCRs.

Overall, the survey results reflect positive attitudes toward relationships with teachers and schools, a high level of parent satisfaction with the Waterford program and the progress children are making, and a high level of parent participation in

children's learning at home. These findings suggest the program has been effective in strengthening the school-to-parent link. Since we have no information on parental involvement for previous Kindergarten classes, it is not possible to determine whether the level of involvement reported by parents represents an increase over prior years. However, 6 of 7 teachers surveyed agreed that the Waterford program has increased parents' involvement in their children's learning (see Appendix B).

V. What are teachers' reactions to the program and to the support they have received in implementing it?

In February 1998 R.A.M. visited all classrooms participating in the Waterford Program and talked with teachers, principals, and Instructional Guides. At that time the Waterford computers had been in place for approximately three months, and teachers appeared to have fully integrated the Program into their regular instructional programs. In one or two classrooms, full implementation of the Program had been hindered during the first month or two by technical problems that ultimately led to reinstallation of the software. Although the teachers in these classrooms expressed their initial frustrations with these problems, in general teachers' attitudes toward the Program were very positive. Teachers reported that students were very eager to work on the computers, excited about what they were learning, and proud of the books and certificates they printed on the computer to take home to families.

Our initial impression of teachers' enthusiasm toward the Program was strengthened by their responses to a survey conducted in May 1998. The survey questionnaire contained 18 evaluative statements related to the Program's content, its

effectiveness as an instructional tool, its ease of use, the staff development and technical support provided to teachers, and students' and parents' reactions to the program.

Responses were arranged on a 5-point Likert scale ranging from "strongly agree" to "strongly disagree." All responses are presented in Appendix B. The following is a summary of survey findings.

Teachers expressed positive opinions about all aspects of the Waterford Program covered in the survey. All teachers expressing an opinion either agreed or strongly agreed with 17 of the 18 statements.

Statements concerning students' interest and enthusiasm toward the Program received the strongest agreement.

- All 7 teachers strongly agreed that their students are interested and enthusiastic about what they are learning in the Program and that students enjoy being able to self-manage their learning on the computer.

Teachers expressed strong agreement with statements concerning the appropriateness of the Program's content, its ease of use, and its ability to be integrated with other instructional strategies.

- 6 of 7 agreed (3 strongly) that the Program has an appropriate mix of lessons. One expressed no opinion.
- All 7 agreed (5 strongly) that the Program is easy to use and user-friendly.
- All 7 agreed (4 strongly) that the computer equipment has functioned reliably most of the time.

All teachers agreed with statements concerning the adequacy of support they have received in implementing the Program.

- All 7 agreed (3 strongly) they have received adequate technical support.
- All 7 agreed (1 strongly) they have received adequate training in the use of the Program.

- All 7 agreed (2 strongly) they feel comfortable with their level of knowledge of the Program and their ability to work with it.
- All 7 agreed (3 strongly) that working with the Program has given them greater confidence in their ability to use computer-assisted instruction.

All teachers agreed with statements concerning the positive impact of the Waterford Program on the school-parent link.

- All 7 agreed (4 strongly) that parents have reacted positively to what the Program is doing for their children.
- 6 agreed that the Program has increased parents' involvement with their children's learning. One expressed no opinion.

6 of 7 teachers agreed (3 strongly) that children in their classes have achieved significantly greater literacy development than they would have achieved without the Waterford Program. One expressed no opinion.

All teachers who expressed an opinion agreed with statements concerning the Program's usefulness in tracking students' individual progress and tailoring instruction to individual needs.

- All 7 agreed (1 strongly) that the Program has helped them track students' individual progress.
- 6 of 7 agreed (1 strongly) that the Program has allowed them to tailor instruction to students' individual needs. One expressed no opinion.

Only one statement ("The Waterford Program has helped me pace the Kindergarten curriculum") received disagreement from any of the 7 teachers surveyed.

- Responses to this statement were mixed, with 3 agreeing (2 strongly), 3 disagreeing (1 strongly), and one expressing no opinion.

The questionnaire also contained space for teachers to comment on their experience with the Program. Of six comments received, three related to the Program's

effectiveness as an instructional tool, its ease of use, children's eagerness to use it, children's excitement about their achievements, and the individual attention the Program gives each child. One teacher remarked, for example,

I have really enjoyed having the Waterford Program in my classroom. It runs smoothly and I have observed my children's progress in part because of this system. My children are eager to use the Program every day. They love to print and see their achievements on paper. It is exciting to see their confidence level build as they continue to advance through the Program.

One teacher referred to her initial problems with the software, which she noted have since been remedied, and two teachers made recommendations for improvement: One suggested color-coding wires on the CPUs, and another suggested it would be helpful to have someone stop by the school regularly to listen to specific problems and help teachers integrate the printed teaching materials into the overall program. One teacher also noted that parents are requesting the programs to use on their home computers.

Overall, our findings indicate that teachers perceive the Waterford Program to be a highly effective instructional tool that complements and provides valuable support to their learning objectives and classroom activities. In general, teachers appear to be satisfied with the level of training and technical support they have received and comfortable with their ability to use the Program. However, the fact that three of six teachers focused their survey comments on technical issues and support suggests that additional technical support and training, particularly in the initial phase of implementation, could further enhance the Program's effectiveness in supporting teachers' instructional activities.

CONCLUSIONS

The Waterford Early Reading Program was implemented in late fall 1997 at Collins Garden and Nelson Elementary Schools as part of a Kindergarten Early Reading Program aimed at (1) helping students develop the essential skills they need to become successful readers; (2) building a strong school-to-parent link; and (3) providing an effective instructional support system for teachers. The Waterford Program was selected because it uses computer technology to provide individualized instruction that complements and supports teachers' instructional strategies and responds to each child's specific needs. In addition, the Waterford Program encourages family involvement in children's learning through the use of videos and books at home. Research, Assessment and Measurement, Inc. (R.A.M.) has conducted a multidimensional study of the impact and effectiveness of the Waterford Program in academic year 1997-98. Based on the findings presented in this report, we offer the following conclusions:

- **On the basis of periodic assessment of seven key measures of emergent literacy development, it is evident that most students participating in the Waterford Program have attained mastery of the following essential skills they need to become successful readers: Letter recognition and formation; phonological awareness; and understanding of print concepts.** By the end of the school year, students' average correct responses in seven key dimensions of emergent literacy development were impressively high: 100 percent in writing their names, 94.6 percent in letter recognition, 92.7 percent in letter sound identification, 84.0 percent in rhyming words, 93.2 percent in recognizing phonemes, 95.3 percent in concepts about print, and 95.7 percent in forming letters. Overall, it appears that 9 out of 10 students

have achieved reading readiness for the first grade.

- **The Waterford Program appears to be effective in helping most students who are far behind at the beginning of the school year to nearly catch up with the rest by the end of the year.** Students who scored in the bottom third of the class in the fall tests of letter recognition made great strides in closing the gap between themselves and the top two-thirds by the spring test. In doing so, they had achieved 36 times the growth of the top two-thirds in letter recognition and 23 times the growth of the top two-thirds in letter sound identification.
- **A small proportion of students (less than 5 percent) continued to lag far behind the rest in most dimensions of emergent literacy development.** According to teachers' observations of these students' learning behavior, most appeared eager to work on the Waterford computer and seemed to be enthusiastically engaged in learning activities.
- **Based on the limited measures available to us for comparison, Waterford participants' level of emergent literacy development appears to be significantly greater than that of students from another school in the same district that does not use the Waterford Program.** In end-of-year assessments of letter recognition, letter sound identification, and Running Record reading levels, Kindergarten students at Collins Garden/Nelson performed significantly better than those at the comparison school. Students at Collins Garden/Nelson were on a par with those at the comparison school in recognition of high-frequency sight words.
- **Waterford participants achieved a significantly higher average reading level than students in the previous year's Kindergarten classes at Collins Garden and**

Nelson Elementary Schools. The only measure of emergent literacy development available for comparison of current Waterford participants with previous Kindergarten classes at the same schools is end-of-year Running Record reading levels. The average reading level for Waterford participants is significantly higher ($p < .01$) than the average for the previous year's Kindergarten classes. The distribution of reading level scores for the two groups shows noticeable improvement in reading level performance this year, with a general shift toward the higher reading level categories.

- **Overall, our findings suggest the Waterford Program has been effective in strengthening the school-to-parent link.** Results of parent and teacher surveys reflect positive parental attitudes toward relationships with teachers and schools, a high level of parent satisfaction with the Waterford program and the progress children are making, and a high level of parent participation in children's learning at home.
- **Teachers appear to regard the Waterford Program as a highly effective instructional tool that provides valuable support to their learning objectives and classroom activities.** In an end-of-year survey, teachers responded positively to statements about the program's content, its ease of use, its ability to be integrated into their instructional strategies, its impact on students' literacy development, and students' and parents' attitudes toward the Program. Teachers appear satisfied with the level of training and technical support they have received and comfortable with their ability to use the Program. However, the fact that 3 of 6 teachers focused their survey comments on technical issues and support suggests that additional technical support and training, particularly in the early phase of implementation, could further enhance the Program's effectiveness in supporting teachers' instructional activities.

LIMITATIONS OF THIS STUDY

- There was considerable variation between schools, between classrooms within the same school, and between students in the same classroom with regard to the total time computers were used. Some classes used their computers less than the anticipated average of 15 minutes per student per day, and some students' time on the computer was substantially below the average for their class. Variations in student use may be due to absenteeism or to teachers' use of the Waterford Program for extra tutorial sessions among other reasons. Variations between classrooms and schools may have been due to technical problems or to teachers' classroom management practices. These variations complicate the overall picture of program effectiveness.
- Some potential long-term benefits of the Waterford Program cannot be fully measured or evaluated within a single school year. It is possible, for example, that the self-managed, semi-constructivist learning activities will have far reaching effects on the learning attitudes and behavior of program participants. Students who enjoy directing and pacing their own skills development in Kindergarten may do much better in homework and schoolwork in later grades. Longitudinal studies of the sustained effect of program participation will be needed to provide meaningful insights into the full impact of the Program.

Appendix A

Student Assessment Procedures

Write first name: Students were asked to write their first names and were assigned a score of 1 if they were able to do so.

Identify capital and lower case letters: Students were shown the Alphabet Inventory from the SAISD's Classroom Assessment Packet and asked to name each letter. The Inventory contains 54 upper and lower case letters arranged in random order, including a "printer's" 'a' and 'g.' Some teachers tested on all 54 letters in the Inventory and others tested on 52, omitting the "printer's" 'a' and 'g.' Scores are based on the percent of letters correctly identified.

Identify letter sounds: Students were shown the Alphabet Inventory from the SAISD's Classroom Assessment Packet and asked to generate the sound of each letter. Some teachers tested on 54 letters (including the "printer's" 'a' and 'g'), some on 52 letters, and others on 26 letters. Scores are based on the percent of sounds generated.

Rhyme words: Students were asked to generate a real or nonsense word that rhymes with each of eight one-syllable words given.

Recognize initial phonemes: Students were asked to identify the beginning sound in each of ten one-syllable words given.

Understand concepts about print: Students were presented with an age-appropriate book (Little Red Hen) and tested on their understanding of essential concepts about how print is organized (e.g., top and bottom of the book, directional rules, and word and letter boundaries). In February this assessment consisted of 10 concepts; in May it was expanded to 12 concepts. Scores are based on the percent of correct responses.

Form upper and lower case letters: Children were given lined paper and asked to print as many letters as they could from memory. Scores are based on the number of letters correctly printed.

Read sight words: Students were tested on their recognition of 25 words from the High Frequency Word List (Early Emergent) included in the Balanced Literacy Assessment Kit published by the Wright Group, Inc. This assessment is part of the SAISD's Classroom Assessment Packet and is used to indicate the extent to which Kindergarten students are accumulating a reading vocabulary of the most frequently used words.

Reading levels: Students' oral reading level scores were determined by the Running Record method using a series of Benchmark Books. The reading level assigned to each student is the highest level at which the student reads with 90 percent accuracy.

Running Record Oral Reading Level Categories

| | |
|---------|---|
| A | Nonreader |
| B | Able to follow simple patterns (no no no) |
| 1 & 2 | Readiness |
| 3 & 4 | Preprimer 1 |
| 5 & 6 | Preprimer 2 |
| 7 & 8 | Preprimer 3 |
| 9 – 13 | Primer |
| 14 – 17 | First Grade |
| 18 – 20 | Second Grade, first quarter |
| 20+ | Second Grade, beyond first quarter |

Appendix B

**Waterford Early Reading Program
Collins Garden and Nelson Elementary Schools**

Parent Survey, May 1998

| Item | N | Agree | Not sure | Disagree |
|--|-----|-------|----------|----------|
| Working on the computer at school helps my child learn. | 100 | 97% | 2% | 1% |
| The Waterford books and videos sent from school are helping me work with my child at home. | 98 | 97% | 1% | 2% |
| Watching the Waterford videos at home is helping my child learn. | 97 | 90% | 7% | 3% |
| Reading the Waterford books at home is helping my child learn. | 99 | 98% | | 2% |
| Other children in the family benefit from the Waterford books and videos sent from school. | 70 | 90% | 4% | 6% |
| I have received help from the school in using the Waterford books and videos. | 93 | 84% | 8% | 8% |

| Item | N | Most of the time | Sometimes | Seldom |
|--|-----|------------------|-----------|--------|
| My child comes home eager to share what she/he has learned in school. | 101 | 84% | 15% | 1% |
| My child is proud of the booklets she/he prints with the computer. | 101 | 96% | 4% | |
| I feel that I can talk freely about my concerns with my child's teacher. | 98 | 85% | 11% | 4% |
| I feel comfortable and welcome when I visit the school. | 96 | 88% | 13% | |
| The teacher keeps me fully informed about my child's learning. | 95 | 88% | 11% | 1% |
| I am satisfied with my child's progress in school. | 95 | 98% | 2% | |

| Item | N | Less than 1 | 1-2 | 3-5 | 6 or more |
|--|----|-------------|-----|-----|-----------|
| In a typical week, | | | | | |
|How many times do you watch the Waterford videos <i>with your child</i> ? | 90 | 11% | 49% | 34% | 6% |
|How many times does your child watch the Waterford videos <i>on his or her own</i> ? | 90 | 11% | 31% | 42% | 16% |
|How many times do you read the Waterford <i>books with your child</i> ? | 92 | 5% | 39% | 42% | 13% |
|How many times does your child read the Waterford books <i>on his or her own</i> ? | 94 | 7% | 28% | 50% | 15% |
|How many times do you review your child's schoolwork? | 94 | 12% | 22% | 26% | 40% |

**Waterford Program Parent Survey, May 1998
Collins Garden and Nelson Elementary Schools**

COMMENTS

1. The Waterford videos have been a great help for both my children. I have a 2-year-old, and because she sits and watches with [my older daughter] she now knows her ABCs. My 2-year-old can even sound out the letters and sing songs. She also demonstrates pretending to read the books. It's given us something else to do together. P.S. I know all the songs too.
2. Came to me as a surprise and I felt very pleased knowing she was really learning and liking it.
3. My only comment is that I am very proud of my daughter and keep using the Waterford videos all the time, every year for the new children.
4. I think that they are doing an excellent job with the Waterford program.
5. I feel that it helped my child a lot and it is helping my other child learn a lot along with my other child. Even though my youngest child is not in school it will help her when she gets to school.
6. During the last three months we've seen our daughter grow in knowledge and understanding. All this is due to the Waterford books and videos. We thank you and appreciate Pauline Nelson for bringing them to our daughter.
7. This program is very helpful. I hope you continue using it.
8. He has really learned a lot. Thank you.
9. The Waterford videos help my smaller daughter learn the ABCs and sounds. My older daughter helps her learn also. I feel that it really works. I really enjoy this program.
10. I am very happy with these books. My two year old even enjoys the video. I sometimes play the video at night for him. Believe it or not, he already knows the song "Blue Bird" and "Tortillas." I want to thank you all!
11. The books and videos are really great. Our son loves to read them to us on his own. He really enjoys the videos also. Thank you.
12. I am very pleased with the books and videos that the teacher sends home with her. She (teacher) has helped a whole lot. Thank you very much, keep up the good work.
13. [My daughter] watches and studies the videos and books every night, and after school she's so glad she could finish her work and was able to work on the computer. She shows everyone at home the booklets. Thanks!!!
14. I'm very satisfied by the videos and books. My child has improved so much, I think it's great and thank you very much.
15. I think that the computers and books were a great idea.
16. I think that it helps all kids with words and speech. My child can start saying the whole video before it goes on. On books, she reads too fast before looking at the words; I think that's good. Thank you.

17. The Waterford program books and videos help all my kids at home.
18. Everything is working out fine. Thank you.
19. My children are not too interested in the videos. I think it's that they go too slow and last too long. They end up leaving the room or find another thing to do.
20. With this program my children are learning about all the different cultures. They love the songs from around the world. My four-year-old has benefited much from the videos.
21. I'm very satisfied. I enjoy it when I watch the videos with them. All the sounds. Special colors on Spanish.
22. I appreciate the opportunity to receive these great books and videos. Thank you.
23. My child enjoys singing the songs and tells me she wants to read a story to me. She enjoys printing out the books and constantly talks about computer time. It is a great program that we all enjoy.
24. Working with the computers has made my daughter knowledgeable of the functions the computers have.
25. I feel my child has learned and progressed with the help of the Waterford program. She loves to watch the videos over and over again. My daughter also plays them for her cousins her age and younger, and helps teach and entertain them as well. My daughter also loves the computers and printer at school. I feel it's very beneficial. Thank you.
26. My child has not brought home any Waterford videos or books.
27. I feel my daughter has learned a lot with the Waterford books, and on the computer.
28. The Waterford videos are entertaining. They learn so much about ABC's sounds. The rhymes stay in their minds.
29. I like the videos because my son loves to listen and see the video. He seems to be interested in a lot of them.
30. I am not able to watch the videos with my son because I have no time. I am always busy. But I will try to watch and read with him. The one that reads and watches videos with my son is my daughter.
31. The Waterford program works, however in my child's case she is more advanced than the level of these videos, and didn't find them challenging.
32. Thank you for the use of videos and book. They are very helpful to my children. Thank you again.
33. The songs in other countries confuse my children. They recently learned English from Spanish.
34. This program has been beneficial to my son's learning. Also the computer is a plus.
35. The Waterford program has really helped my child. She really likes me to read to her and read on her own. She likes the videos. I would also like to mention, I am a child care provider and the children love to read them and watch the videos.

36. I would like to comment that I have six children, and all of them really like the Waterford videos and books. The small children really benefit from this program. Thank you.
37. I feel it's a good program as far as educational and entertainment as well. My child really enjoys the videos and books.
38. Using the computer program at school has made my daughter become more interested in computers and her vocabulary is good, and (she) is able to recognize words.
39. [My son] has really improved at home by watching the videos and my younger children too.

**Waterford Early Reading Program
Collins Garden and Nelson Elementary Schools**

Teacher Survey, May 1998

| Item | N | Strongly Agree | Agree | No Opinion | Disagree | Strongly Disagree |
|--|---|----------------|-------|------------|----------|-------------------|
| 1. The Waterford program has helped me pace the Kindergarten curriculum. | 7 | 2 | 1 | 1 | 2 | 1 |
| 2. The Program has helped me track students' individual progress. | 7 | 1 | 6 | | | |
| 3. The computer assessment and management system has allowed me to tailor instruction to students' individual needs. | 7 | 1 | 5 | 1 | | |
| 4. The computer software can be integrated with the instructional strategies in my class. | 7 | 4 | 3 | | | |
| 5. The program has an appropriate mix of lessons, with adequate time spent on phonological awareness, letter recognition, and understanding of print concepts. | 7 | 3 | 3 | 1 | | |
| 6. Overall, my students are interested and enthusiastic about what they are learning in the Program. | 7 | 7 | | | | |
| 7. My students enjoy being able to self-manage their learning on the computer. | 7 | 7 | | | | |
| 8. I can see the impact of using the Waterford materials at home in my students' performance. | 7 | 1 | 6 | | | |
| 9. Overall, children in my class have achieved significantly greater literacy development than they would have achieved without the program. | 7 | 3 | 3 | 1 | | |
| 10. In general, parents have reacted positively to what the Program is doing for their children. | 7 | 4 | 3 | | | |
| 11. Overall, the Program has increased parents' involvement in their children's learning. | 7 | | 6 | 1 | | |
| 12. The Program is easy to use and user-friendly. | 7 | 5 | 2 | | | |
| 13. The computer equipment has functioned reliably most of the time. | 7 | 4 | 3 | | | |
| 14. I have received adequate training in the use of the Program. | 7 | 1 | 6 | | | |
| 15. I have received adequate technical support in the use of the Program. | 7 | 3 | 4 | | | |
| 16. I feel comfortable with my level of knowledge of the content of the Program. | 7 | 2 | 5 | | | |
| 17. I feel comfortable with my ability to work with the Program. | 7 | 2 | 5 | | | |
| 18. Working with the Program has given me greater confidence in my ability to use computer-assisted instruction. | 7 | 3 | 4 | | | |