



# Evaluation of Waterford Early Learning Software

A study conducted in Shuvu Network Schools in Israel

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The current study investigates how using computer software for English instruction affects teacher/student attitudes and student progress. The study includes first-grade students of similar socioeconomic status. Half of the schools in the study use *Waterford Early Reading Program*<sup>TM</sup> for English instruction, and the other half uses more traditional methods of teaching. Students who use *Waterford Early Reading Program* learn English independently through songs, games, and other activities. Waterford is implemented in two ways: independent learning where every 20 minutes a different student uses the computer in the back of the classroom, and classes in which all the students are in a computer lab and students have their own computer (in this setting, learning is done during the whole lesson). The results show that students using Waterford outperformed students who learned English through other means, especially in the areas of letter-naming fluency, and nonsense-word fluency. Furthermore, the results show that students who used Waterford (experimental group) made significant progress, advancing from the lowest level to the highest level in the course of the year. Additionally, the results show that both teachers and students responded positively to using Waterford for English instruction.

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## Background

This research paper examines how using *Waterford Early Reading Program* for English instruction influences teacher attitudes and student learning.

Waterford's program, *Waterford Early Reading Program*, is a program developed in the United States for English instruction. *Waterford Early Reading Program* uses computer software that was developed with the purpose of teaching English reading to students in kindergarten and elementary school. The program introduces students to a variety of tasks in different levels that are tailored to each student's progress. Students work independently using software installed on a computer, which involves student interaction and learning through the use of songs, games, and activities.

This study was conducted with first-grade students in 6 Shuvu schools: 3 schools in which English is being taught using Waterford and 3 schools with students of similar socioeconomic



status (SES) that do not use Waterford as part of their teaching methods, but are teaching English in a traditional way. Shuvu includes 69 kindergartens and schools that were established to address the needs of immigrant children from the Soviet Union in the 90s. Shuvu's purpose is to provide educational content (especially math and computers) and Jewish content in order to ease children's integration into Israeli society.

Most of the children in Shuvu come from families with low and medium SES and some of the students are from single-parent families. Today, many of the students in Shuvu are not immigrants. However, some immigrants are from the Soviet Union, and Hebrew is not their first language. Therefore, English is the third language for some of the students.

Waterford is implemented in Shuvu schools in 2 ways:

1. Independent learning where every 20 minutes a different student uses the computer in the back of the classroom.
2. Classes in which all the students are in a computer lab and students have their own computer. In this setting, learning (using Waterford) is done during the whole lesson.

This research concentrated on schools using Waterford in a computer lab.

## Study Objectives

The evaluation study of Waterford was used to evaluate experimental schools in the Shuvu network. The study concentrated on the influence of the program on teachers and students by

- Evaluating student achievement (in experimental and comparison schools)
- Examining changes in teaching (in experimental schools)
- Examining changes in the school as a whole (in experimental schools)

## Study Questions

### Questions Regarding Student Attitudes

1. While using Waterford to teach English, is there a change in student involvement in learning?
2. Is there a change in student motivation and in fondness for the subject?
3. Are there changes in student performance (in comparison to the comparison group and to the students themselves)?



## Questions Regarding Teacher Attitudes

1. While using Waterford to teach English, are there changes in the way English teachers are teaching English? If yes, how and how did the program contribute to it?

## Study Participants

The study participants included

School principals

- Three school principals from Shuvu where Waterford is taught using a computer lab (n=3) and 3 principals who participated in professional development in 2011.

Teachers

- First-grade English teachers from Shuvu schools where Waterford is being used in the lab (n=5 at the beginning of the year, n=4 at the end of the year), and 8 additional teachers from different Shuvu schools who participated in professional development during the year.

Students

- First-grade students from 6 Shuvu schools—138 students in the experimental group, who used Waterford in the lab, and 106 students in the comparison group who attended different schools where Waterford is not used to learn English.

## Study Materials

| Materials  | N  | Frequency of use                       |
|--|--|--|
| Principal interviews                                       | 3  | End of year                            |
| Teacher interviews   | 5 at the beginning 4 at the end                                | Beginning and end of year              |
| DIBELS test  | First-grade students—138 in experimental and 106 in comparison | Beginning and end of year              |
| Student interviews in real time while working on computers | 7 students at the beginning of the year and 6 at the end       | Beginning and end of year              |
| Questionnaire for teachers in professional development     | 8  | During the school year (December 2010) |
| Questionnaire for principals in professional development   | 6  | During the school year (February 2010) |



## Results

The results show that the effectiveness of the program is noticeable with regard to learning and teaching. In addition, the results help to identify needs and challenges that should be addressed.

### Results Using DIBELS

Students from the experimental and comparison groups were tested using the DIBELS test. The test included four subsections used to evaluate student skills. According to the test instructions, student scores could be divided into three levels: low, medium, and high. Student performance in the experimental and comparison groups was evaluated using these levels.

The results show that in some of the DIBELS skills, students using Waterford have an advantage, especially in letter-naming fluency and in nonsense-word fluency.

Results in the different skills are presented below:

#### Initial-sound Fluency

In initial-sound fluency (figures 1 and 2), there was a significant statistical change in the experimental group between the beginning and the end of the year. In comparison to the end of the year, the data showed that the two experimental schools A and B had a statistically significant advantage compared to the comparison group. In addition, at the beginning of the year, many of the student performance scores in the experimental and the comparison group were in the medium level. However, at the end of the year, more students in the experimental group were placed at the highest level compared to the students in the comparison group. Therefore, more students from the experimental group advanced to the highest level, compared to the students in the comparison group.



Figure 1. Initial-sound fluency results

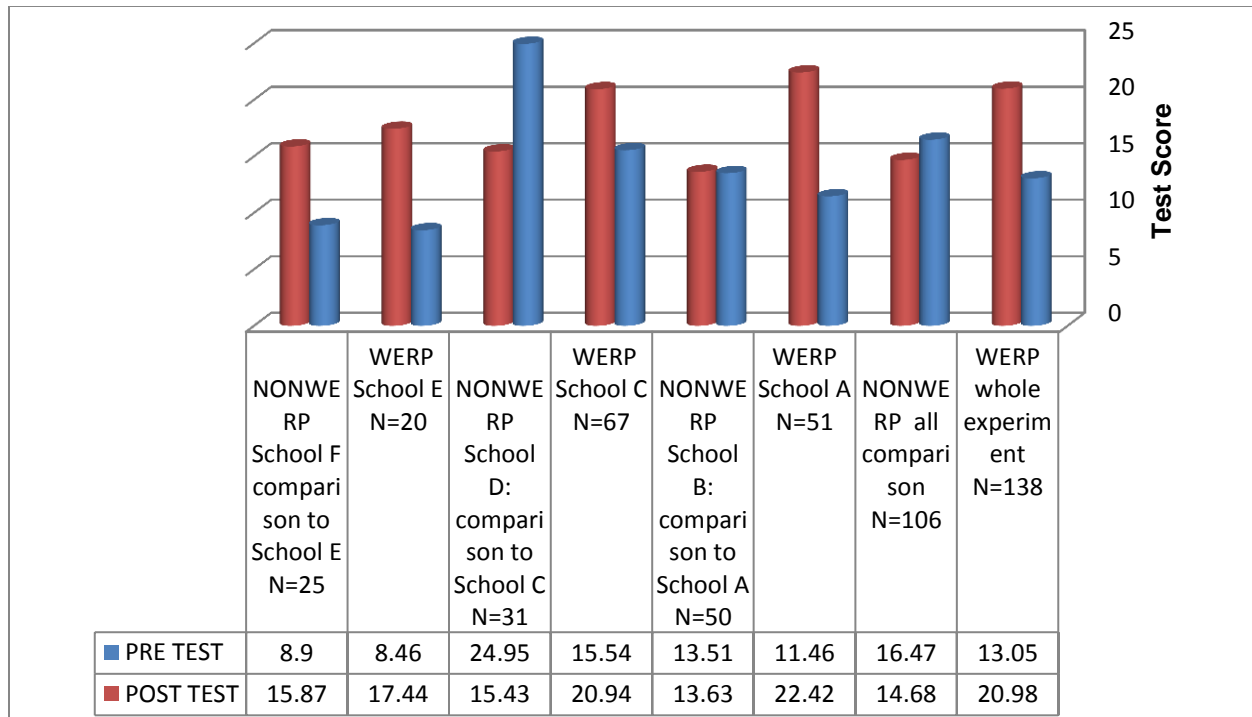
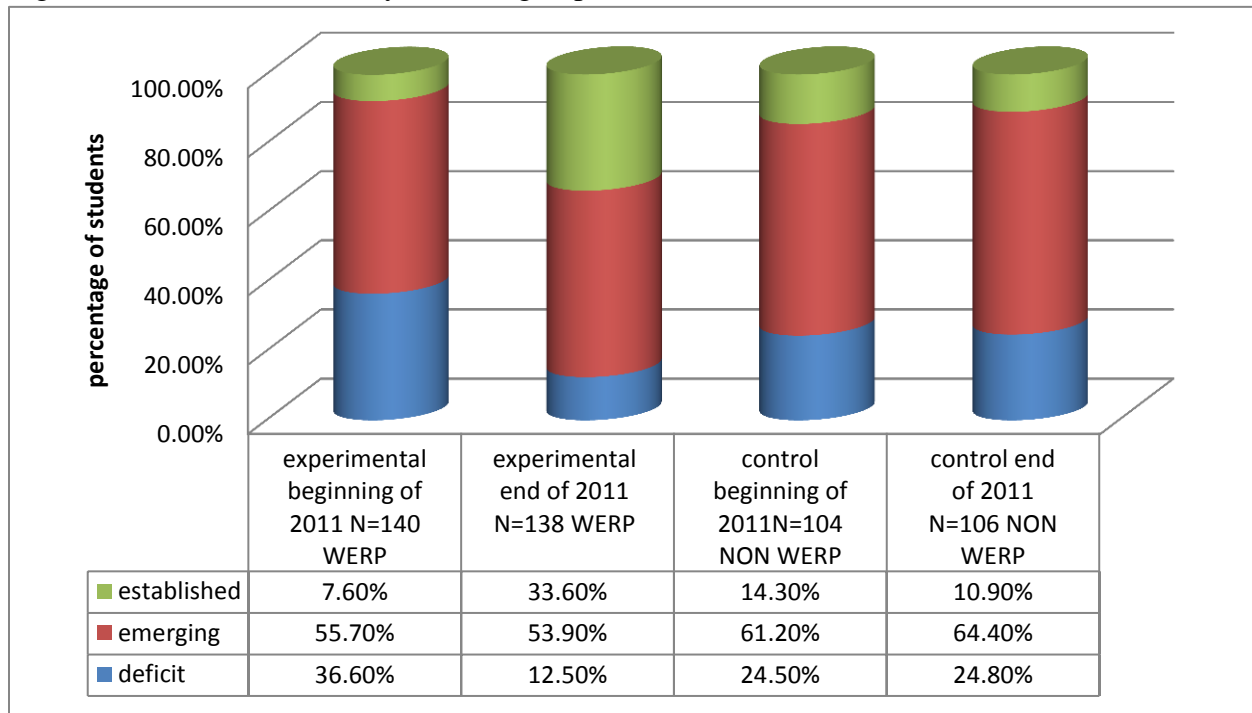


Figure 2. Initial-sound fluency according to performance levels





## Letter-naming Fluency

In letter-naming fluency (figures 3 and 4), there was a statistically significant change in student scores from the three schools in the experimental group between the beginning and the end of the year. Compared to the paired comparison group, there was a statistically significant advantage for the schools in the experimental group compared to the comparison schools at the end of the year. Additionally, at the beginning of the year, many of the students in both the experimental and the comparison groups were placed in the lowest level. At the end of the year, many of the students in the experimental group progressed to the medium and high levels, whereas most of the comparison-group students remained in the lower level. Similar to the results in initial-sound fluency, more students from the experimental group advanced to the highest level, compared to the students in the comparison group.

Figure 3. Letter-naming fluency results

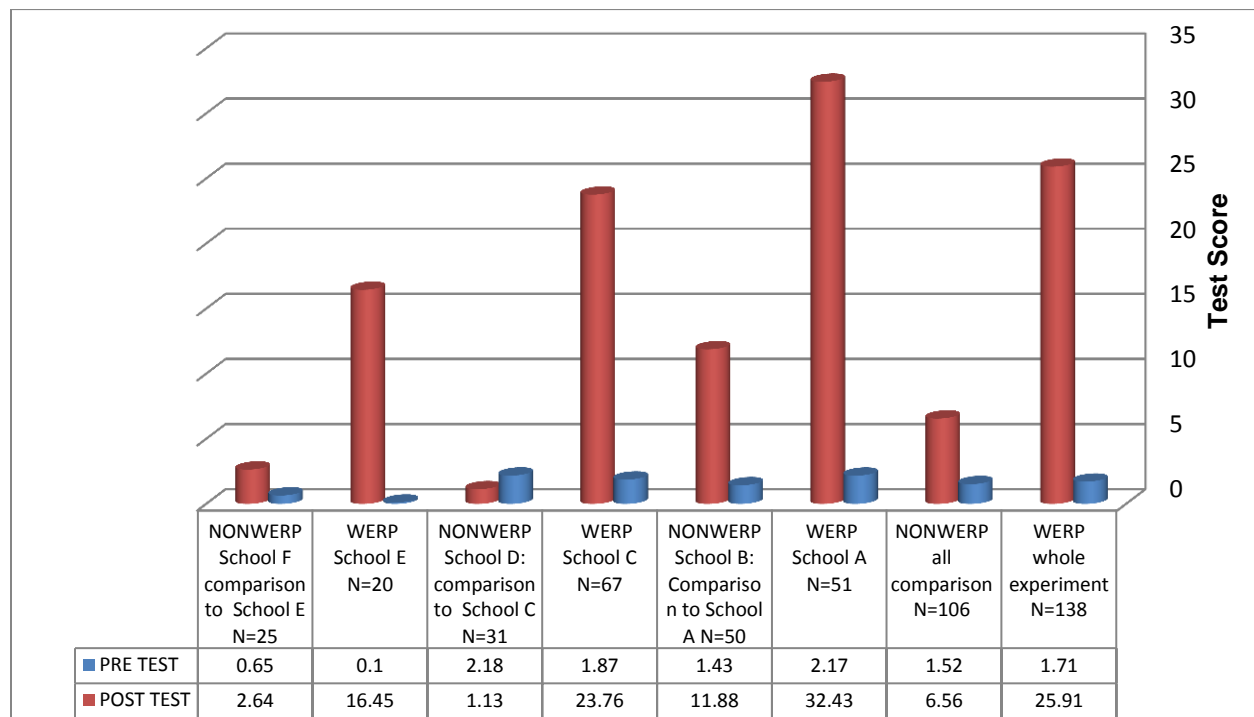
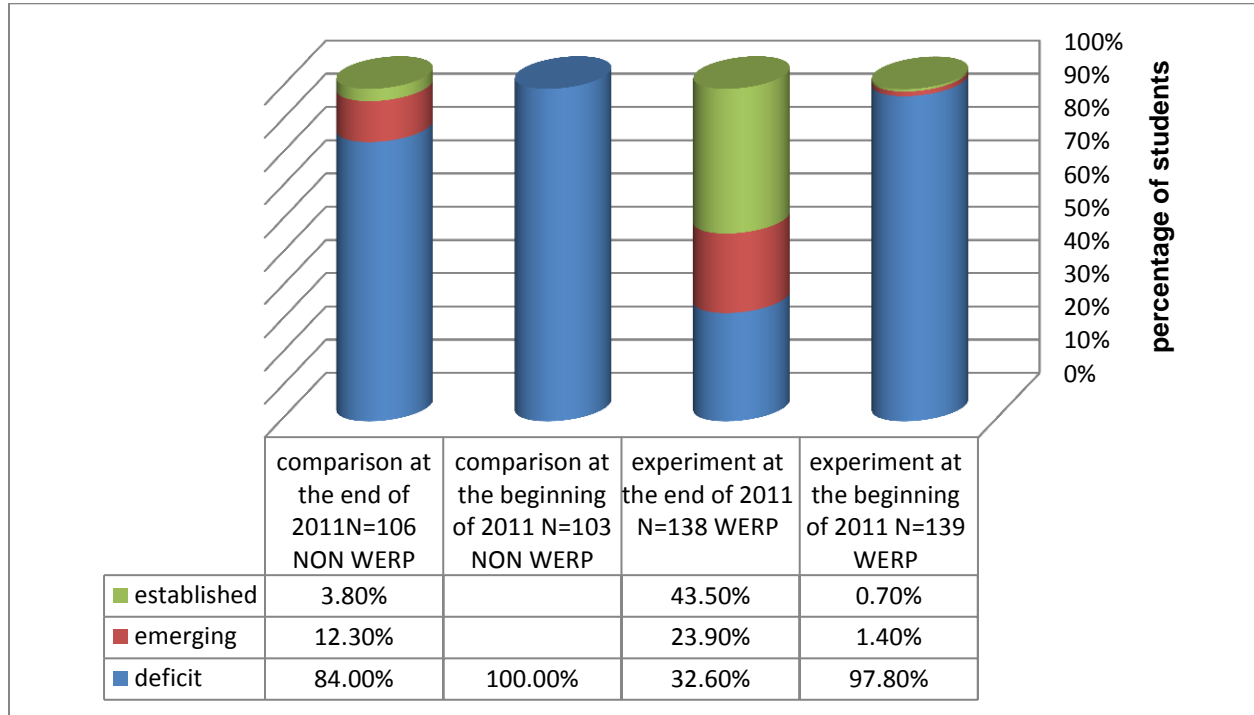




Figure 4. Letter-naming fluency according to performance levels





## Phoneme Segmentation

In phoneme segmentation (figures 5 and 6), most of the student levels at the beginning of the year were high in both groups. At the end of the year, there was a significant gain for all students. However, when comparing the paired schools at the end of the year, there was a statistically significant difference for one of the schools (School C) in the experimental group compared to the comparison group. Additionally, at the beginning of the year, many student scores from the experimental and comparison groups were placed at the highest level, and most of them stayed there at the end of the year. Therefore, learning these skills using Waterford and using a traditional way of learning, advanced students in a similar way. Since students started the year with a relatively high level, it is possible that their skills were not related to learning English.

Figure 5. Phoneme-segmentation fluency results

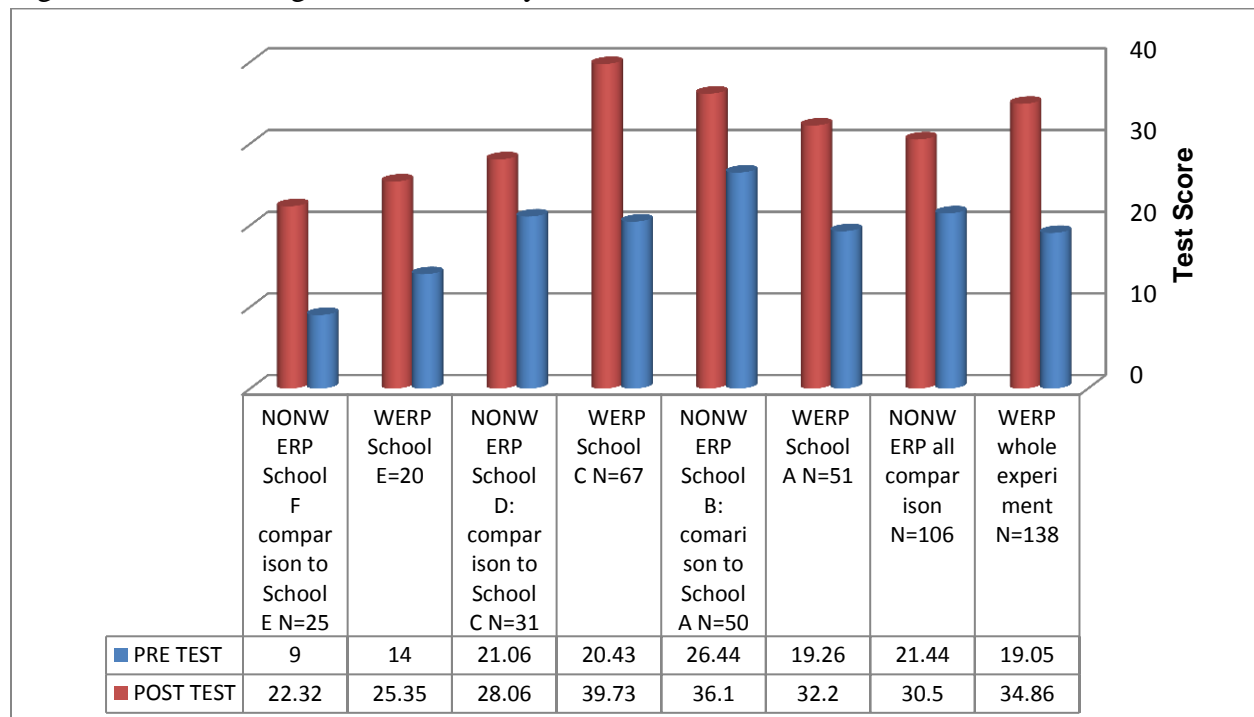
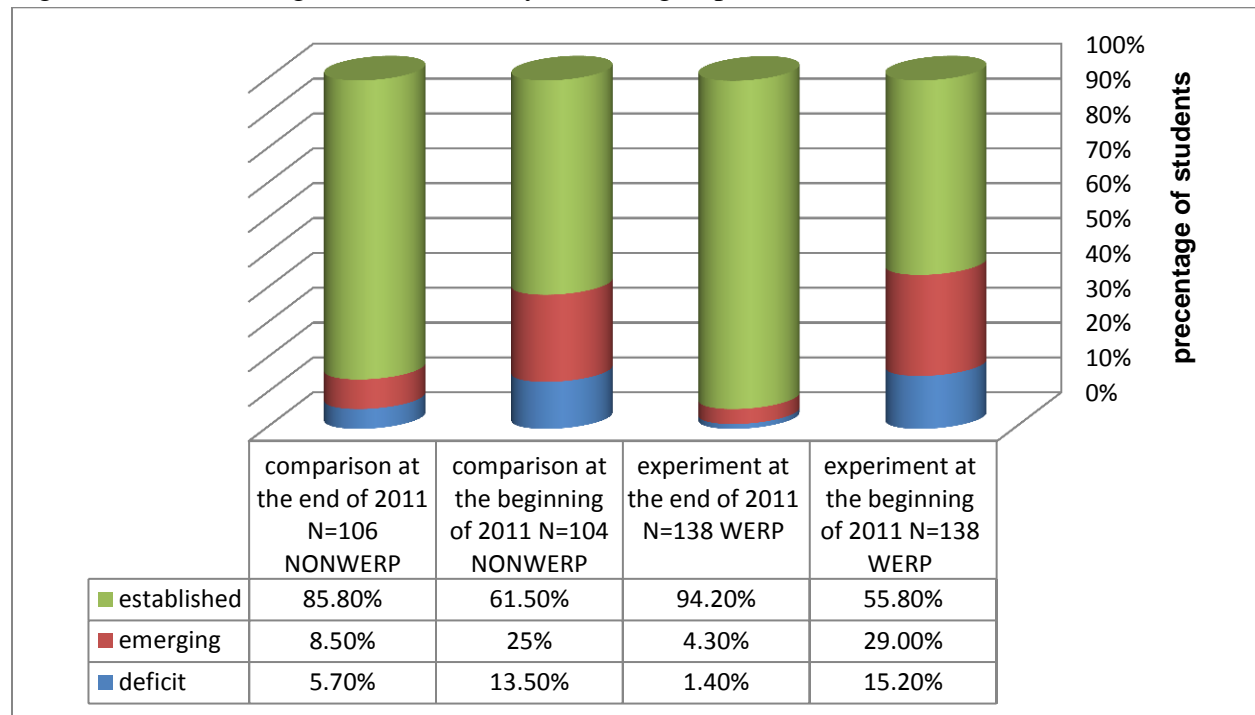






Figure 6. Phoneme-segmentation fluency according to performance levels



### Nonsense-word Fluency

In nonsense-word fluency (figures 7 and 8), there was a statistically significant change in student scores in all of the experimental schools from the beginning to the end of the year. In the paired comparison at the end of the year, there was a significant advantage to all the experimental groups in comparison with the comparison groups. Additionally, at the beginning of the year, most students scored at the lowest level. At the end of the year, most of the experimental group students were placed at the highest level. In comparison, less than half of the students in the comparison group were placed in the highest level. Therefore, more students in the experimental group were placed in the highest level compared to students who learned in a traditional way.



Figure 7. Nonsense-words fluency results

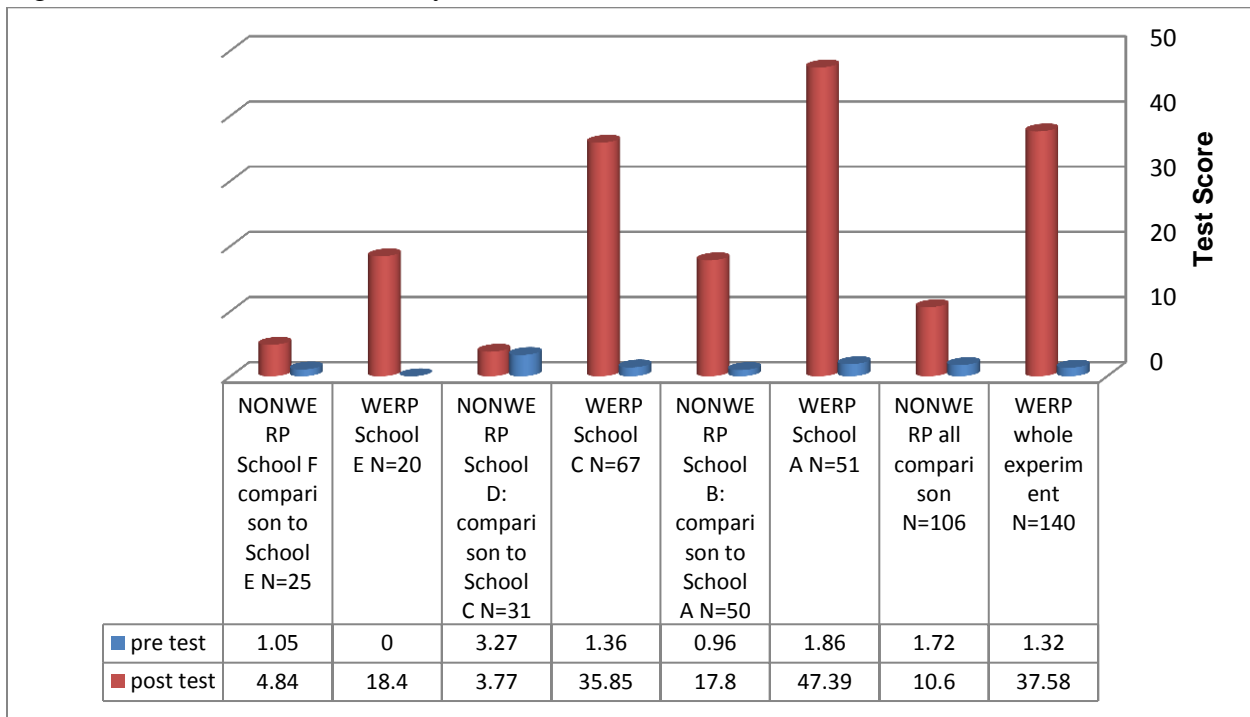
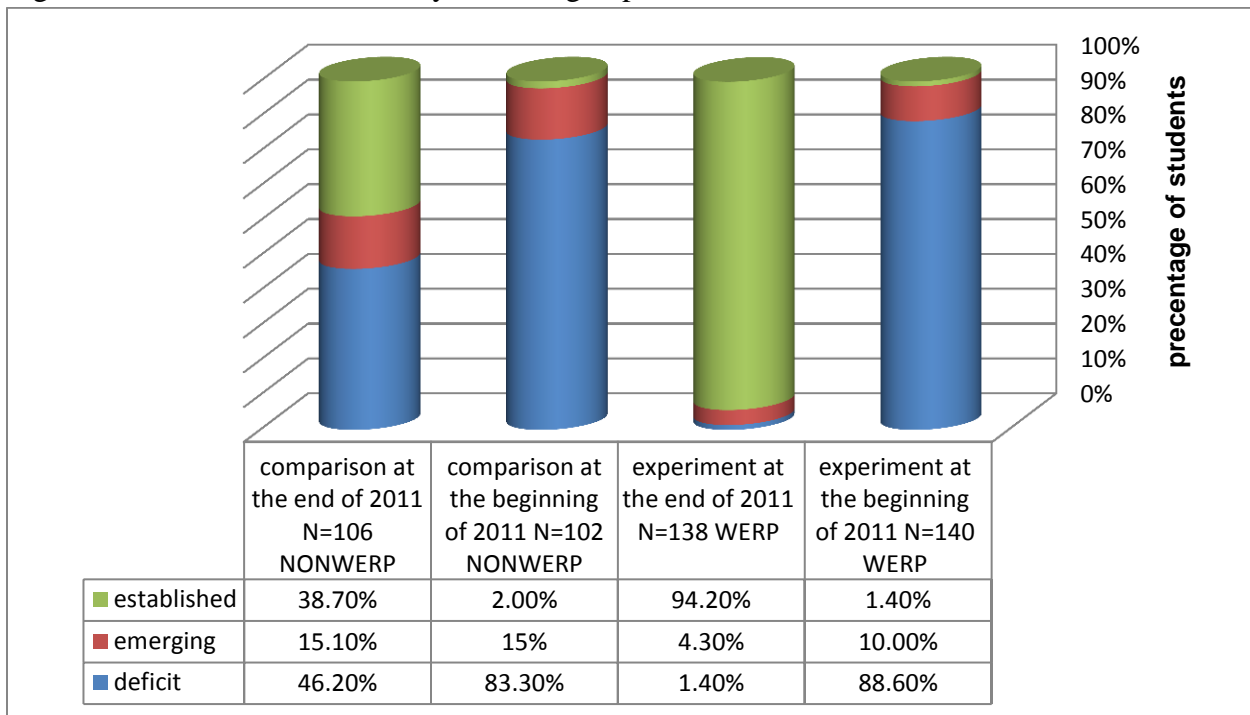


Figure 8. Nonsense-words fluency according to performance levels





## **Student and Teacher Perceptions Results**

### **Student Perceptions—Program Influence on Learning**

The results of the interviews with principals, teachers, and students in this study show that using the Waterford program enhances their enjoyment and motivation to learn English. Students view learning in the lab as a game, especially because of the use of games and songs in the software.

It is also apparent that some of the students prefer to work independently in the lab; they prefer to use the features of the software, like computer feedback and replay of content for independent learning. Furthermore, students preferred using the Waterford software, as it required less teacher involvement. Though some difficulties were mentioned at the beginning of the year, it seems that toward the end of the year, most students understood how to use the program even though instruction was only given in English.

Additionally, teachers and principals gave positive feedback regarding

- The sequencing ability of Waterford's software to adapt tasks to the student levels
- The presentation of lessons in varying degrees of difficulty
- The repetition of content according to the progress of the student

### **Teacher Perceptions—Program Influence on Teaching**

The teachers using the program did not report change in the perception of their role, but they noted that in the lab lessons, there was more of a possibility for personal contact with each student. Additionally, the work in the lab provided teachers with additional tools to evaluate students. However, there was a grade given for the work completed in the lab in only two schools.

Teachers also reported that learning in both the lab and class allowed for more material to be taught, since students came to class after they learned part of the material in the lab. Some of the teachers tried to create a connection between the material in the lab and the in-class lesson, but some teachers had a hard time doing that because of curriculum requirements. All teachers were satisfied from the training they received in the program, and they asked if they could have more training in the next year.

Teachers and principals reported that the program positively influenced the community and parent perception of the school.

In most cases, teachers and principals did not report any disadvantages in working with the program. The main challenges were technical issues with the computers and the electrical system, but the frequency of those issues was not high.