

# eBook Dictionary Study: Huffer Memorial Children's Center 2005

Richard Bellaver  
& Julie Gentry



## Introduction

The Center for Information and Communication Sciences (CICS) at Ball State University in conjunction with Huffer Memorial Children Center continues to conduct research on the usability and value of electronic books (eBooks). Thanks to an [AT&T](#) Foundation Industrial Ecology Faculty Fellowship five graduate students: Chris Bruszewski, Hosung Choi, Elizabeth Hill, Tommy McLaughlin, and Fumni Olorunda were able to run this study and assist in the creation this documentation.

Huffer Memorial Children Center is a member of the local Delaware County United Way. Huffer also acts as an after school care venue for K-6 students until their parents get off work. The great aspect of this project is that the children get to work with a piece of technology that they might not otherwise be able to work with if the project was not being done.

The purpose of this project is to continue the research that began in the spring of 2004 by Professor Richard Bellaver and students from CICS. The purpose of the testing is to determine if, to the children, an eBook is a comparable or superior reading device compared to a conventionally printed book. If a child can read as easily and enjoyably from an eBook, as from a bound book, then all of the child's books could be placed onto this electronic reader and lessen the load of his or her book bag. The eBooks used in this testing (REB 1200's) were previously obtained through the Lilly-endowed university research project.

## **Previous Results**

Research done in the spring of 2004 was divided into two phases. The first phase was to test the usability of the eBook in general. This was done by a group of researchers who created a survey completed by 15 children. The conclusion reached from these results was positive since the children aged 6 through 9 were able to understand and manipulate the technology with very little training. Documentation of the study is available from Professor Bellaver at [rbellaver@bsu.edu](mailto:rbellaver@bsu.edu).

The second phase of the previous research was used to study a dictionary tool located in the eBook. This testing was done by first introducing the students to the dictionary tool by showing a video and working with the children in a hands-on-teaching exercise. These students were then sent home to take a five-question test that was specifically created to teach the student how to use the tool and to show the range of vocabulary knowledge of the children. The children were allowed and encouraged to work on this test with their parents and to take as much time as was needed to complete the test and create an understanding of the technology. These children returned to Huffer and took the same test, but without the help of the eBook or their parents. Due to time constraints, only five children were tested in this part of the project. The results showed that three of the students had perfect scores on the test at home and in school. One answered all questions correctly at home, but missed one at school. The fifth student missed three questions at home and in school. Since the testing was over a short period of time and there were only five subjects the study was not published, but the details are available from Professor Bellaver.

The conclusion reached in the 2004 testing was that the project was a success. For the most part, it seemed that the parents took the time to work through the dictionary and the test with their children. The test results were somewhat surprising, but do add stability to the hypothesis that children can be taught how to use the eBook dictionary to learn and retain knowledge.

## **2005 Testing**

The methods that the research group used to administer the tests for the 2005 project were derived from the previous research team's efforts. In order to create credible results, as well as, to obtain a better understanding of the eBook Dictionary two distinct steps were created within the training process. The first step was to show all the children a video on how to use the eBooks. The video is a step-by-step process that walked the children through the basic operation of the eBook and how to work the dictionary feature. Next, students were organized in groups of four and worked with either a member of the staff from Huffer or a member of the CICS team. A practice worksheet was given out and members of the group worked through the worksheet with the students. This procedure allowed the research group to work directly with the students, so the other features of the eBooks did not sidetrack them. These two steps created a comfortable and knowledgeable environment for the children, so that the usage and testing process could be easily achieved.

## ***Methodology***

Early on it was understood that children at the Kindergarten through first grade levels could not be tested with the same words as the children at the second through fourth grade levels. Thus, the researchers, with the advice of the Huffer staff, decided to create two different tests for the children. Having two different tests for the grade levels was unlike the previous dictionary ebook test. When the project was introduced in 2004, it only used one test for all grade levels. The new group felt that a better comprehensive understanding of the students' ability to use the dictionary of the eBook would be achieved by creating two different tests. One test had words that were categorized for the

age group Kindergarten through first grade, and the other test had words for the age groups second through fourth grade.

The test was given once with the assistance of the teacher of the class and the second time it was taken home. The home test was developed so that the children would be able to get help from their parents. The tests were labeled “pre” and “post”. “Pre” being the test that was taken in the presence of the teacher and “post” being the test that was taken at home with their parents. Each test, no matter which age group, consisted of five questions. The questions were multiple choice and the children had to pick out from the choices which answer matched the exact answer from the eBook. This way the group could make sure that the eBook was used instead of a conventionally printed dictionary.

Sample question:

What does **hat** mean?

- a. Covering for head
- b. Hood
- c. Put on when cold
- d. Cap

## **Results**

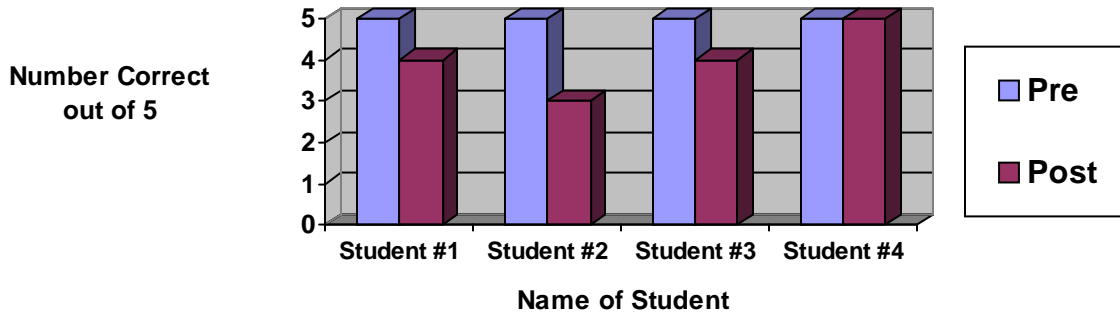
The question of whether or not eBooks are easy for lower grade levels students to use to help facilitate their education is critical. eBooks can help children look up words when they are trying to do a school project. The test was used to determine whether the eBook was something that a student would be able to use on his or her own or if the child would need help from a teacher or parent to use it.

The post and pre-test were used to determine the “help” factor. From the test results the research group was able to determine if the teacher helped the child. When helped, he or she was able to do an excellent job with the eBook. Most students scored very high on the pre-test. Some even got 100 percent of the questions correct. Unfortunately, the grades slipped when the eBooks were taken home to the parents. It can only be speculated that the parents did not help the children as had been expected, or that the children did not ask for help from their parents.

The sample consisted of four Kindergarteners, five first graders, three-second graders, one-third grader, and two-fourth graders. Results of the research are classified in a grade-by-grade comparison. The first graph includes the results of the Kindergarten

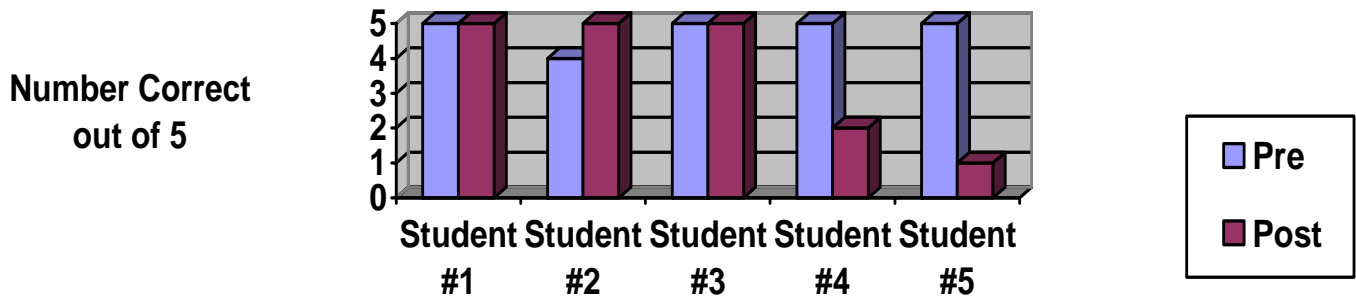
children. It seems that when the children were helped by the teacher, each one got all of the five questions correct, but when the test was taken home all of the students but Kindergarten Student #4 missed at least one. The following is the grade breakup of each student that was studied in the sample:

### Kindergarten Results

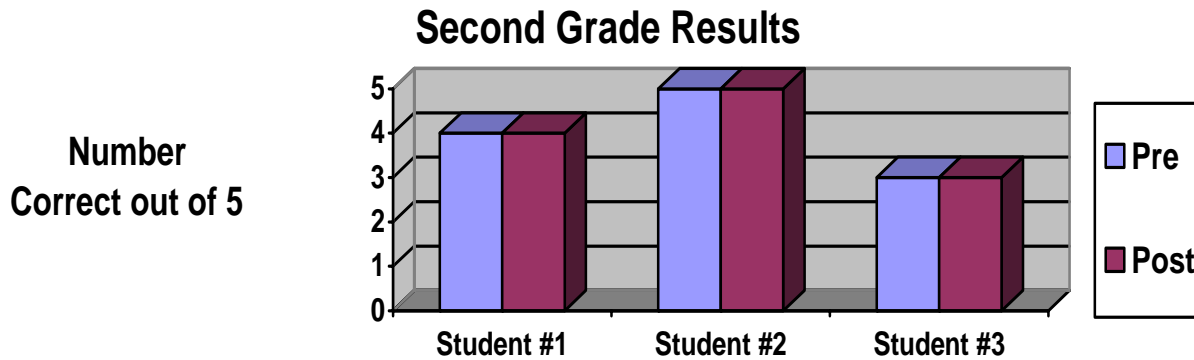


In comparison between the two graphs, one can see that the Kindergarteners did better on the pre-test, but missed more on average than the first graders did with the post-test.

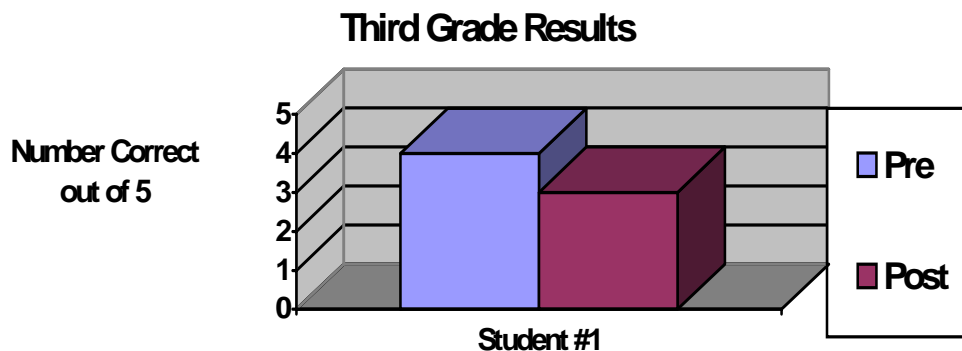
### First Grade Results



The next group of children tested was the second graders, and they seemed to have a lot more trouble with the test than any of the other grade levels. The overall average of words missed in both the pre-test and post-test were higher with this grade level than any other level tested.

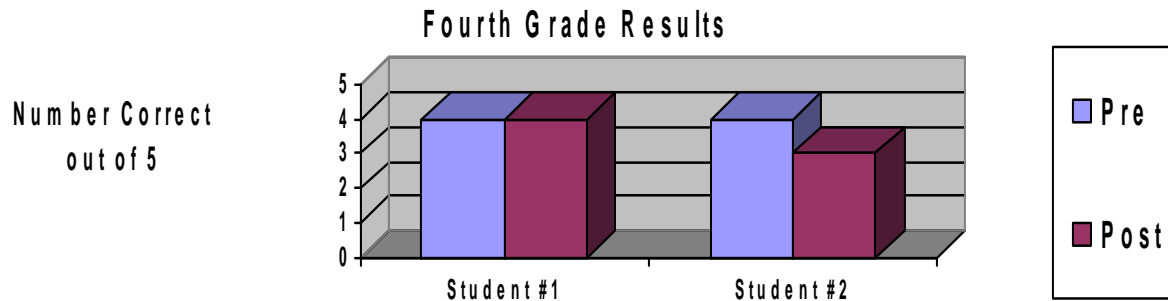


The next group that was tested was the third graders. Unfortunately, there was only one-third grader available for the test. This student did extremely well during the pre-test only missing one question, but then missed two in the post-test. Here is the graph of the child's achievement:

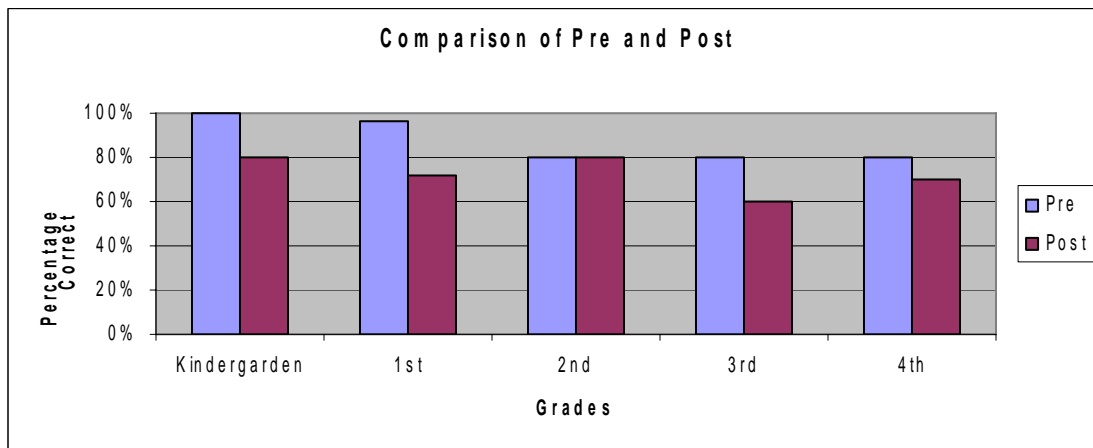


The last grade level that the group was able to test on the eBooks dictionary was a group of fourth graders. There were two students. Both students did exceptionally well during the pre-test. They both only missed one question each and when they took the test home during post-testing they did not do better than they did in the pre-test. According to the test results Student #1 still missed the exact same question he had missed during the pre-testing, and Student #2 missed two when she took it home, but only missed one during the pre-testing.

Here is a graph of the fourth grade results for the eBooks testing:



Below is a graph showing a percentage comparison of the tests scores for the different grade levels.



The test that was completed in 2004 had only a sample of five children. The test that was completed this year was given to a group total of 15 children. In a comparison of test results it was concluded that the Kindergarteners and first graders had a better overall completion average than the second through fourth graders. The group believes from asking the teachers that this was caused from the lack of attention given to the testing. The Kindergarteners and first graders seemed to find the eBooks more entertaining than the older groups. Also, the words were harder for the second through fourth graders than the words were for the younger groups.

## Potential Errors

Throughout conducting the research and testing with Huffer our group discovered different aspects of the process that could have potentially influenced the project scope, which would in turn create errors in the testing results. When working with children it is always difficult to tell if they are taking the assignment seriously or if they are doing what they are told without actually paying attention to what they are supposed to accomplish. This problem could possibly skew the results of a test. There is a possibility that the children that were associated with this testing took the eBook home and did not try to work with the device or try to learn what items were on the test, and just went through and found the definition, filled in the answer, and then went on with what they wanted to accomplish.

Also, we encouraged the parents to work with the children to help them better understand the test, the device, and the words that were within the test. If a child had to do all of this alone, there is probably a lower percentage chance that there would be any information retained. There are also problems created on the opposite end of the spectrum when the parents get too involved with the process and will answer the questions for the children and the device was not even used for what it was intended.

## Conclusions

This study confirms the premise that it is possible to use an eBook as a dictionary at the elementary-level. Although no official timings were conducted, researcher observation indicated that several children were able to find the right answer faster with an eBook than with a traditional dictionary. While operating the eBook the children also learned the basic principles of operating any electronic device. Furthermore, the Kindergarten children and the first graders found the eBooks exciting. For them, it is an adventure to learn how to use it. They felt more like they were getting to play rather than being forced to learn while they were using an eBook, and it made it easier for the teacher to keep their attention. However, the older children do not find eBook that exciting anymore. It was very difficult to keep their attention, which was also demonstrated by the surprisingly poor test results of the 2<sup>nd</sup> and 3<sup>rd</sup> graders.

It is essential to tell the teachers and the parents about the advantages and disadvantages of using eBooks and to train them on how to use the eBook, so that they can help their children or students use it more efficiently. Working with an eBook is more difficult for some children than for others, and these children need help from their parents or their teachers. Some children had lower scores in the take home test, where they worked with their parents at home, than in the test they took at school with the help of their teacher.

A new version of an eBook dictionary is now available. More study, including comparison timings of look-up on both eBook and hard copy, will be attempted in the next round of research. The full student report with all test materials is available at [rbellaver@bsu.edu](mailto:rbellaver@bsu.edu) .