

Evaluation of Galaxy Kids Reading Programme

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EVALUATION OF GALAXY KIDS READING PROGRAMME

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Abstract

This evaluation was designed to assess the impact of the new Galaxy Kids programme on 5-year old new entrant pupils who were learning to read. The CD-Roms were developed by Wendy Pye Ltd. and make use of technology to present a balanced reading programme, teaching phonemic, phonic, word knowledge, fluency and comprehension skills in an interesting way. In order to evaluate the programme, four schools of similar socio-economic status were selected from Auckland's North Shore, and those children in two of the schools who were aged 5.0–5.4 years, were tested before and after two terms working through the Galaxy Kids programme. Their progress was compared with that of similar pupils in the other two schools, who were working on typical New Zealand programmes, supplemented by the "Jolly Phonics" scheme.

Tests of nine different reading skills showed that the Galaxy Kids children made significantly more progress in oral fluency of unseen text, and in their ability to comprehend what they read. They also showed a greater ability to discriminate a wide range of words from similar words presented to them. There were no differences on a range of phonemic tests, nor on knowledge of the alphabet letters, as virtually all children had mastered these. The gains detected in this evaluation provide some heartening indications of the potential of technology for assisting children to learn the art of reading.

Introduction

The Galaxy Kids Programme is a new initiative, developed by Wendy Pye Ltd to help five-year-old children learn to read, using state-of-the art technology. It is described as a balanced reading programme, which incorporates the best of New Zealand reading methods and resources. The programme consists of a well-designed series of interactive CD-Roms, supported by little reading books, and teacher resources, with high-interest activities to assist children to learn letters, phonemes, high-frequency words, sentences and comprehension of continuous text.

As the programme is a new one, it was considered important to carry out an evaluation of its impact on a typical sample of five-year-old children, and compare it with other more conventional programmes in common use in New Zealand junior primary classes.

The evaluation project was carried out in four schools in Glenfield, a middle-class suburb of North Shore, Auckland. In two of these schools, the new entrant teachers implemented the Galaxy Kids programme, while the other two followed their normal programme. All the schools were judged to be slightly above average in socio-economic status (Decile 7 on a 10-point scale), and all have experienced teachers in the new entrant classes. All have children from a variety of ethnic groups, but the majority are Pakeha-European, speaking English at home.

The project began in the second week of Term II, 2005. All new-entrant children of 5.0 to 5.4 years in the four selected schools were pre-tested, shortly after they started school and before they started their reading programme. The testing was carried out by two assistant researchers after a training session and some monitoring from me. Both the assistants are experienced teachers of young children, accustomed to interviewing and testing new-entrant pupils. The project continued for two school terms, from the beginning of May to the middle of September 2005.

Test Development

Before the project began I studied the expected outcomes of the programme, and examined a range of tests used to assess these outcomes. The main benefits expected from using this programme are improved performance on the following skills:

- Knowledge of the Alphabet.
- Phonemic Awareness.
- Oral Reading Fluency
- Word Identification
- Reading Comprehension.

As there was no recognised battery of tests used in New Zealand to measure such a wide range of skills in five-year-olds, I developed a new series of tests, in two parallel forms (A and B). For the phonemic tests, I leaned heavily on descriptions of other tests such as the Sutherland Phonological Awareness Tests, and those used by Bradley & Bryant (1983), Stanovich et al. (1984) and Yopp (1988).

The selection of words to include in the vocabulary tests was done systematically, from general sources and from sources related to the Galaxy Kids programme. The tests were administered to one child at a time: Form A for the first, Form B for the second, and so on, alternately. If a child was given Form A for the pre-test, she/he had Form B for the post-test. For the alphabet test, all lower-case letters were tested, in random order, either in Form A or Form B. For the phonemic tests, several different formats were investigated. We eventually settled on tests of initial, medial and final sounds, (with and without pictures), and detection and deletion of phonemes in common words. We designed two tests of word identification, one requiring the child to identify a given word from three or four similar words, and one requiring the child to name each of a graded series of words presented on a card. Half the words were chosen randomly from the US Dolch List of 220 words in common use, and half from the lessons in the Galaxy Kids programme. In fact, there was much overlap in these criteria. All were words in the oral vocabulary of typical five-year-olds.

The four passages used for testing oral fluency and reading comprehension were prepared especially for the tests. They are short narratives which use familiar language, and the contents are within the experience of most children of this age. As few children could be expected to read the passages unassisted in the pre-tests, we agreed to read each passage aloud to each child, and then ask them to read it back to us. If children were unable to identify at least 10 words from the first passage of the form they were tested on, the test was discontinued and they were not asked the reading comprehension questions. In the post-tests, we read the first passage aloud for the children to repeat. For the second passage, they read without such prompting. Again, they had to read 10 words correctly before they were asked the comprehension questions.

Before the programme began, a Wendy Pye staff member and I tried out the tests on 25 five-year-olds in three schools (not in the project), in order to refine the test questions. After some revisions and deletions, we found satisfactory results. The two series of tests are of equivalent difficulty. Most children of this age were unable to identify more than a few words, and few could read the passages orally. Many, however, were familiar with the letters of the alphabet. We tested a few older children to ensure that the harder questions were working satisfactorily.

Implementation of the Programme

The teachers from the four schools met together with the developers on two occasions before the programme began. Each teacher listed the methods and programmes they used for teaching reading to new entrant children in their schools. The selection of schools to teach the Galaxy Kids programme was discussed at the first meeting. One school (*School A*) had already piloted the Galaxy Kids programme, and wished to continue with it. Another school (*School B*) was selected as the second project school, because it had only one new entrant teacher who would need to be trained. The other two schools (*Schools C and D*) each had two or three teachers working with the five-year-olds in the project. The latter schools were considered more suitable as control-group schools because, in a comparison of a CD-Rom programme with a less structured, teacher-directed programme, the influence of any one particularly effective, or ineffective teacher would be diluted if more teachers were involved. These two schools were told that they would have an opportunity to try out the programme later on. The choice of project schools was made before the pre-testing began.

The testing of the five-year-olds was conducted in the second and third week of the second term, and the instructional programme began at the same time. Each school had between 15 and 20 children in the age range of 5.0—5.4 years who were starting to learn to read. However, a few had already made some progress, as a result of learning at home, or in the first term at school. Therefore it was important to administer the full set of pre-tests to all children. In the event, the two groups proved to be very similar in average and in the spread of their pre-test scores. A total of 72 children participated in the pre-tests, 33 in the project group and 39 in the control group.

The teachers in the two project schools used the CD-Roms every day, as part of their Shared Reading programme. Guided Reading and Guided Writing sessions were daily activities. The two control schools followed a traditional New Zealand reading programme, with daily sessions on Shared Reading, Guided Reading and Guided Writing. The commercial *Jolly Phonics* programme was also used in both control schools. Teacher aides were available to assist children falling behind. All classes emphasised the learning of letters, phonemes and high-frequency words, usually within a meaningful context.

Between the pre-tests in May and the post-tests in September, several children changed schools, two were dropped due to long absences, and School B promoted some children to a more advanced class in August. These changes meant that the numbers of children who took part in the post-tests was reduced to 65, or 26 in the project group and 37 in the control group. Three of the children in School B were given the post-test in August, shortly after they were moved out of the Galaxy Kids programme. Their scores were typical of the remainder of the children in their school who were tested in September, so they were retained in the project group, even though they had only 9–10 weeks on the Galaxy Kids programme. Most children were exposed to it for 15–17 weeks.

Results

Table 1 presents the mean scores for the project and control groups, on each test for the pre-test phase (May) and the post-tests (September). The results for Forms A and B were combined.

Table 1
Pre-Test and Post-Test Means for Project and Control Groups

	<i>Project Group</i>		<i>Control Group</i>		
	<i>Pre-Test</i>	<i>Post-Test</i>	<i>Pre-test</i>	<i>Post-Test</i>	<i>(Possible Score)</i>
No. of children	26	26	37	37	
Alphabet	9.03	12.53	8.21	12.45	(13)
Initial Sounds	6.99	10.92	5.70	9.86	(12)
Phoneme Detection	5.35	7.36	5.24	7.08	(10)
Phoneme Identity	4.65	7.38	3.59	6.70	(10)
Phoneme Deletion	0.85	4.73	0.95	3.41	(10)
Word Discrimination	3.42	9.42	3.44	7.85	(15)
Word Identification	0.96	6.35	0.84	4.47	(20)
Oral Fluency	0.65	42.53	0.51	26.86	(70)
Comprehension	0.00	4.23	0.03	1.81	(9)

It is clear, from the post-test column, that most children in both project and control groups had mastered the alphabet by the time they had had two terms at school. A few still had trouble distinguishing ‘p’ from ‘q’, but there were no other consistent errors. The overall post-test mean was 12.5, out of a possible score of 13 letters (see right-hand column). Likewise, most children “hit the ceiling” of the test of initial sounds, (mean = 87%), so there was no possibility of showing significant differences between the two groups on these two tests. In the phoneme detection and identification tests, both groups improved from approximately 50% to 70%, so there was little to choose between the two approaches here.

In phoneme deletion (*Say “goat”. Now say it again, but don’t say the “g”*) both groups started from near zero. A few children in each group were unable to perform this task at all, even after several examples and explanations. The project group gained by more than the control group, as they did in each of the remaining tests of word discrimination, word identification, oral fluency and comprehension. In order to check for statistical significance, the gains made by each group were calculated, means and standard deviations (SDs) computed, and t tests applied to the differences in mean gains. These statistical tests demonstrate whether the differences found between the groups were large enough to be considered real gains, and not due to chance factors.

Table 2 sets out the means and SDs for the gain score means for each test, and the results of the t tests. For the first two tests, the Ns were reduced by dropping those children who scored close to the possible score on the pre-test. Obviously, for these pupils, there was little room for gain between pre-test and post-test. This was not a problem in any other test.

Table 2
Gain Score Means & SDs for Project and Control Groups

	<i>Project Group</i>		<i>Control Group</i>		<i>t</i>	<i>Significance</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>		
Alphabet	7.90*	3.45	8.21*	4.66	0.23	
Initial Sounds	5.32*	2.32	5.13*	2.73	0.29	
Phoneme Detection	2.01	3.58	2.05	3.20	0.10	
Phoneme Identity	2.73	2.12	3.16	2.55	0.75	
Phoneme Deletion	3.88	3.46	2.45	2.89	1.79	
Word Discrimination	6.00	2.36	4.51	3.51	1.99	**p<.05
Word Identification	5.39	4.79	4.03	3.87	0.87	
Oral Fluency	41.9	21.7	26.6	22.8	2.65	***p<.01
Comprehension	4.23	2.41	1.78	1.89	4.27	***p<.01

* Ns reduced due to high pre-test scores

** Difference is significant at the 5% level – i.e. there are only five chances in 100 that a difference this large could be due to chance factors.

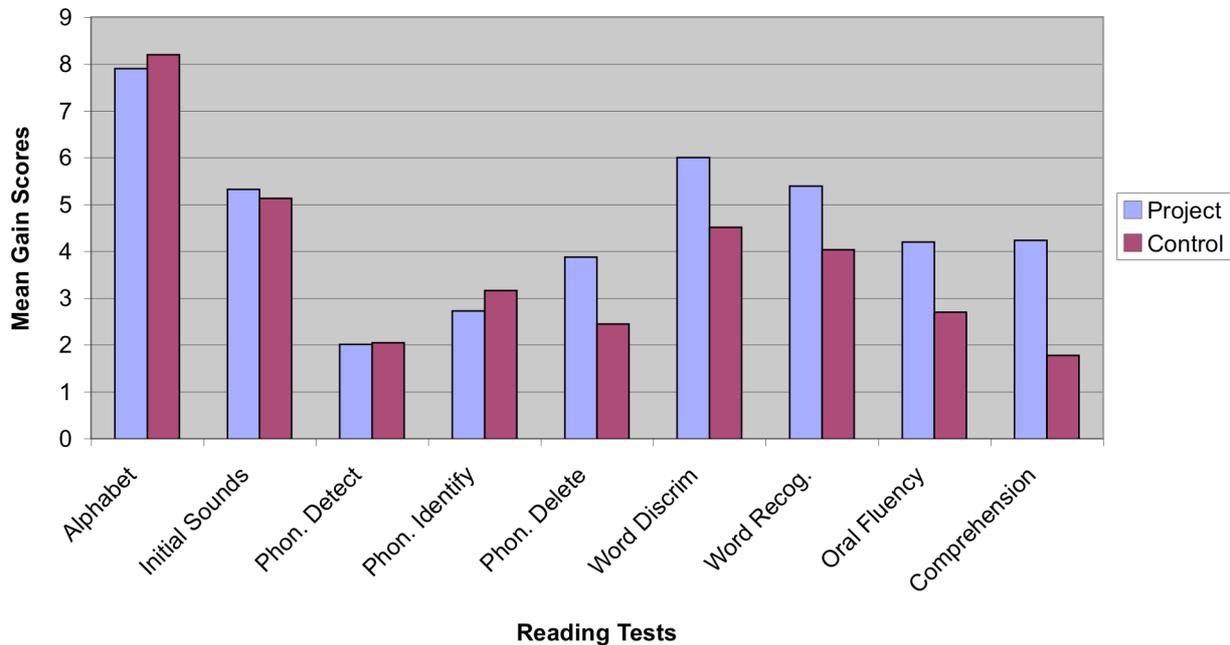
*** Difference is significant at the 1% level – i.e. there is only one chance in 100 that a difference this large could be due to chance factors.

Inspection of Table 2 shows that there were no significant differences between the groups in the tests of alphabet letters and of phonemes. The t tests were all less than 1.96, the level required for statistical significance in comparing two groups of this size. However, the Galaxy Kids Project Group showed significantly greater improvement in their ability to discriminate similar words, their oral fluency of unseen text, and their ability to comprehend what they read. The Project Group also showed greater gains in phoneme deletion and word identification, but the spread of the scores was wide and the numbers of children too small to be sure that the differences were really significant, and not due to chance factors.

Figure 1 shows the differences between groups in graphic form. The Project Group is depicted as Series 1 and the Control Group as Series 2. In this figure, the Oral Fluency scores for both groups have been divided by 10, to bring them into line with the other test scores. Again, it is clear that the Project Group has made considerably greater gains in the skills that reflect real – vocabulary, fluency and comprehension.

Figure 1

Figure 1: Mean Gains for Project and Control Groups



Conclusion

The purpose of this evaluation was to assess the impact of the new Galaxy Kids programme on five-year-old children who were learning to read. Four similar schools were selected from Auckland's North Shore, and those children in two of the schools who were aged 5.0—5.4 years, were tested before and after 17 weeks working on the programme. Their progress was compared with that of children in the other two schools, who were working on typical New Zealand programmes.

Tests of nine different reading skills showed that the Galaxy Kids children made much more progress in oral fluency of unseen text, and in their ability to comprehend and explain what they have read. They also showed a greater ability to discriminate a wide range of words from similar words read aloud to them, for example:

"Which word says climb?" *clean/ climb/ clone/ came.*
"Which word says bird?" *bid/ bird/ bard/beard*

There were no differences on a range of phonemic tests, nor on knowledge of the alphabet letters, as virtually all children had mastered these.

The gains in fluency and comprehension were large, even after a period of only 17 weeks. Most children at the outset were unable to read a simple paragraph aloud, even after the research assistant had just read it to them. After 17 weeks on the Galaxy Kids Programme, most could do this task (on a parallel story), and most could also read a second, more difficult story without any prompting. They then answered six open-ended comprehension questions, with considerable success. The amount of progress in these skills was very impressive. The research assistants also commented on the greater enthusiasm of the Galaxy Kids children. They obviously enjoyed reading, and the testing process was seen as a kind of game-like challenge. These are important virtues in building a positive view about reading in later years.

One way to interpret the gains made is to express them as a percentage of the gains made by the control groups over the same period. In the case of Oral Fluency, the Galaxy Kids group showed a gain of 58% more than the control group. In the Reading Comprehension test, the gain was 138%, and for Word Discrimination it was 33%.

Some might wish to downplay the strong impact as due, at least partly, to a novelty effect. Certainly, there was a high degree of interest on the part of the children, but if it was due to novelty only, it would be unlikely to persist over 17 weeks of daily use. Moreover, one of the teachers who implemented it was completely unfamiliar with it, two weeks into the second term, and took some time to master the procedures. Furthermore, three of the pupils in her group had only 10 weeks on the programme. The school which had used the programme first achieved very impressive results which were diluted a little by those of the second school. Thus, it is probable that the impact would have been greater if the circumstances had been ideal. But that would be unusual in a project which has to take account of the daily exigencies of a busy school.

In short, this evaluation has shown that the Galaxy Kids programme, when incorporated into a typical New Zealand programme, is successful in teaching children to read in an interesting and effective way. It produced impressive gains in the children's ability to read aloud fluently, in their comprehension, and in their ability to read a wide range of words. The children also mastered the basic skills of letter knowledge and phonemic awareness skills as well as other children working on a programme designed to teach such skills. These gains provide some heartening indications of the potential of technology for improving children's ability to master the art of reading.

References

Bradley L. & Bryant, P. (1983). "Categorizing sounds and learning to read." *Nature*, 301, 419-421

Stanovich, K., Cunningham, A., & Cramer, B. (1984). "Assessing phonological awareness in kindergarten children." *Jnl. of experimental child psychology*. 38, 175-190

Yopp, H. (1988). "The validity and reliability of phonemic awareness tests." *Reading Research Quarterly*. 23, 159-177

Author's Biography

Warwick Elley is Emeritus Professor of Education, University of Canterbury, and now residing in Auckland. His main research interests revolve around language, reading and assessment issues. He has developed a range of reading assessment tools for teachers, including the PAT series and the STAR tests of reading. He has evaluated many reading projects, in New Zealand and overseas, and the "Book Flood" concept that he helped develop in the Pacific has been successfully adapted to the primary schools of many countries, such as Singapore, Sri Lanka, Fiji, Vanuatu, Brunei, and South Africa. In the early 1990s he served as chair of the International Survey of Reading-Literacy in the schools of 32 countries. In 1992, the International Reading Association awarded him the International Citation of Merit, and he was subsequently elected to the Association's Reading "Hall of Fame". He spends much of his time in retirement working on literacy projects in developing countries.
