The ReadingWise English computer-based literacy Program for accelerated reading acquisition in UK schoolchildren: A randomised control trial

An interim report

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Abstract: The problems of children failing to acquire age-appropriate reading skills have been widely reported. Recommendations for improving reading abilities have been made by a number of researchers, including the call for the use of technology. The computer-based literacy programme, *ReadingWise English* was tested with schoolchildren in the UK whose reading age placed them in the lowest 20% in reading ability of their class. Using a randomised control design, the intervention group reported significant improvements in reading age relative to controls. The benefits of this accelerated literacy acquisition programme using computer-based technology in schools are discussed.

Introduction

Educational failure should be addressed through harnessing cognitive and technological resources and applying them to prevent children moving towards lives of social exclusion, behavioural problems and crime (Beddington, Cooper, Field, Goswani, Huppert et al., 2008). A key aspect of literacy learning is the decoding of words, spaces and correspondence of letters and sounds (Wyes & Jones, 2001). Technology has been proposed to support literacy learning, the benefit of using computers has been discussed and its widespread use encouraged (Torgerson & Barker, 1995). While a computerised system of learning might allow autonomous and interactive learning it has also been established that individualised instruction tailored to the ability of the pupil experiencing difficulty is most likely to prove beneficial (Connor, Piasta, Fishman, Glasney, Schatschneider et al., 2009). A computer-based literacy program that enables learners to proceed autonomously, regardless of their current level of ability, may present a pragmatic and economic alternative to the prolonged individual attention of a teacher or teaching assistant (TA).

The Brooks Review (2003) undertook a comprehensive review of studies which concluded with a recommendation for the use of explicit, structured and reinforced interventions for struggling language learners. Successful intervention is likely to bring interpersonal, social and educational benefits to children as enhancing the reading ability of has been reported to increase self-

confidence, motivation and further reading interest (Mortimore, Hansen, Hutchings, Northcote, Fernando et al., (2012).

There are several aspects of literacy development. Phonics is the aspect of literacy that addresses the relationships that exist between letters, sounds and their combinations. The Department for Education and Skills (DfES) commissioned a review of evidence from randomised controlled trials to establish the effect of phonics on reading and spelling in school-age children (Torgerson, Brooks & Hall, 2006). This, and a review of intervention schemes designed to improve literacy skills Brooks (2007) saw several recommendations made for future research.

Brooks (2003) had previously emphasised the importance of a short-term, focused intervention for enhancing language acquisition in struggling bilingual learners. However, although delivery was recommended by using teaching assistants (TAs), the use of a computer to deliver the programme in the current study required only general supervision of the class, rather than direct supervision of individual readers. Such efficient use of TAs represents an economic advantage to programmes that require direct and persistent contact with professional staff.

In keeping with the call for technological, cognitive and empirical resources to be brought to the field of literacy-learning, a randomised control trial was designed to test the *ReadingWise English* (RWE) program to schools in the United Kingdom. As a rapid learning experience was predicted, its application was tested with a sample of children known to be in the bottom 20% of reading ability for their age group.

Method:
A randomised control design with control group crossover was employed. The first part of the study was undertaken between March and July 2013. To secure the highest participation and response-rate, a formal targeting of schools was undertaken. Five schools in in the South of England were recruited to take part in the study. In consultation with Heads and Deputy Heads, informed consent was secured and compliance with ethical standards for research assured on behalf of participants and, in the case of children, their parents or guardians.

Participants
One hundred sixty four children (Girls = 54 (32%); Boys = 110 (68%)) aged 6.1 – 15.5 years at Time 1 took part in the study. The sample met the selection criterion of being comprised of the lowest 20% of children on reading ability in each class.

Apparatus
Internet-enabled desktop and laptop computers were used with online access to *ReadingWise English* (RWE) software. The Chrome browser was used due to its voice recognition facility to record and assess performance on decoding.

Instruments
GL Assessment-New Group Reading Test (GL-NGRT) is a test of sentence completion and passage comprehension that allows comparison with national age-level standards. The GL-NGRT allowed the use of an online assessment to be independently marked.

Schonell Graded Word Reading Test (Schonell, 1955) is a standardised pencil-and-paper reading test that lists 100 words of increasing reading difficulty. Words are read aloud until a sequence of 10 have been incorrectly pronounced.

Burt Reading Test – revised (Burt, 1974) is a standardised pencil-and-paper reading test that lists 110 words of increasing reading difficulty. Words are read aloud until a sequence of 10 have been incorrectly pronounced.

Procedure
Pupils were allocated to a computer by a teacher or teaching assistant and encouraged to follow audio instructions in the RWE programme to complete its various stages. RWE staff were present as far as possible to provide technical expertise and support to teachers and teaching assistants.

The RWE programme was followed in 30- to 60-minute sessions over a 4- to 10-week period, after which assessments were made both online (GL-NRGT) and manually by RWE assessors for pencil-and-paper tests. Children allocated to the control group condition took part in activities designed to be unrelated to RWE tasks. To complete the crossover design, the control group will undertake the RWE programme upon completion of this initial10-week intervention.

Results
There were no pre-test differences between the intervention group and the control group on the GL-NGRT ($t=.98$; df (1, 156); ns), Burt ($t=.79$; df (1, 154), ns) and Schonell ($t=.91$; df (1, 154), ns) (all 2-tailed).

Post-test differences were found between the intervention group and control group on Burt ($t=1.95$; df (1, 144), $p<.05$) and Schonell ($t=2.02$; df (1, 143), $p<.05$) but not on GL-NGRT ($t=.98$, df (1, 113); ns) (all 1-tailed).

Discussion
The RWE intervention was found to significantly increase reading age, relative to controls, when measured on the manually-administered Burt and Schonell scales, but not on GL-NGRT scales. Examination of the frequency distribution for the GL-NGRT assessment suggests that a substantial minority may have avoided answering the first question. It appears feasible that as online completion was not directly supervised, children had the choice to answer or move on to the next response screen and some, given their history of failure in reading, may not have been motivated to attempt the first question. It had been observed by supervisory staff that some children engaged with the programme yet made no

attempt to answer the questions. Possible explanations for non-participation in the GL-NGRT online scoring scheme included task-fatigue for those whose concentration levels did not extend to 60 minutes. Some participants simply objected to undertake the online assessment although this did not occur with manual scoring undertaken by an adult assessor.

This study heeded the call for the use of technological, cognitive and empirical resources in the field of literacy-learning (Beddington et al., 2008) and met the demand for a short-term, focused intervention for enhancing language acquisition (Brooks, 2003). As such this intervention can be seen to be in keeping with prior theory. Given that the RWE programme was directed at the lowest performing 20% of readers in the participating schools' classes the prospects for matching children's reading age with the chronological age appear realistic. Furthermore, the RWE intervention was shown to require no more supervision than can be achieved using a single TA in a classroom of children. The economic benefits of employing a single supervisor to achieve gains in reading age that are more consistent with 1:1 interventions will be clear.

Conclusion

If, as predicted, the follow-up to this crossover design finds similar improvements in the control group after receiving RWE intervention, the establishment of an accelerated reading programme for children may be close. As the relatively modern and technologically-advanced GL-NGRT appeared to be problematic with this sample, the use of other validated measures of reading ability should be considered in future research. Given the promise of this brief (1-2 month) and simple-to-administer programme, replication of this study should be undertaken to confirm the prospects for effective learning in children at risk for low reading-age attainment. Additional RCT crossover designs with children from various socio-demographic backgrounds and reading levels are now called for.

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