

# Combining retrieval practices with Look, Cover, Write, Check improves pupils' progress in spelling

## INTRODUCTION

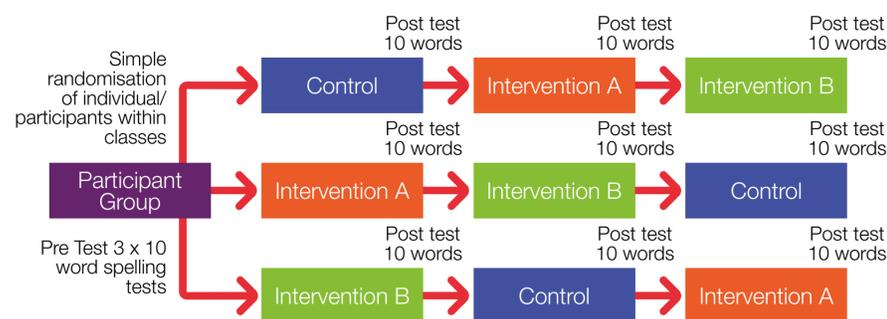
There is evidence that exposure to a multiple-choice test which children do not know the answer to can improve the learning of that information on a later occasion (Little and Bjork, 2011). Little and Bjork suggest that when children do not know the answer they may attempt to retrieve other relevant information in order to assess why the other answers are not correct and ultimately deselect the most unlikely answers. Engaging in this form of mental processing leads to a test becoming 'a learning event' in itself. At the same time, strategies like Look, Cover, Write, Check (LCWC) (shown to be effective in a previous teacher-led RCT (Morris, 2016)) may well be effective because they encourage the holding of new information in working memory and the repetition of that information in a salient way (see for a discussion, Churches et al., 2017).

## THE RESEARCH DESIGN

A within-participant design with a pre- and post-test was used. The pre-test was conducted prior to randomisation, to ensure that pupils at the upper end of the quartile could be analysed separately in case of a ceiling effect from their results. The independent variable **multiple-choice testing** was defined operationally by creating three counterbalanced conditions:

- IV level 1 (Control) – no multiple-choice testing, LCWC
- IV level 2 (Intervention A) – multiple-choice testing
- IV Level 3 (Intervention B) – teaching method used in control condition (LCWC) in conjunction with multiple-choice testing

Figure 1. Research design



## LIMITATIONS

The initial sample size of 106 children was reduced to 86 due to attrition as a result of pupil absence. All children involved in the study were from two schools serving similar socio-economic backgrounds which may not be representative of the whole population.

### Recommendations for future research

Future research may wish to explore the combination of approaches in more detail and the possible negative effects of multiple-choice testing alone with very young pupils; additionally, both replicating the study and looking into other subject areas within a primary school.

## METHOD

### Participants

Westfield Community School and Platt Bridge Academy together form the Westbridge Teaching School Alliance. The two primary schools serve two separate communities in Wigan with high levels of socio-economic deprivation. The research was completed in four Year 6 classes (two in each school). Classes were already stratified in mixed-ability and mixed-gender groups, but were split into three teaching groups. To achieve partial counterbalancing, the three teaching groups were each randomly allocated to the order in which they experienced the three conditions. A total of 106 children were due to take part in the study; however, 20 pupils were removed due to attrition. The results are based on 86 participants (43 boys and 43 girls).

### Procedure

Pupils completed a pre-test of all 30 words three weeks before the trial, to reduce possible learning from the initial test.

- The **control condition** consisted of ten spellings, using Look, Cover, Write, Check (normal classroom practice).
- **Intervention A** consisted of ten spellings, using a multiple-choice test as 'a learning event'. Pupils were given the correct answer at the end of each multiple-choice test.
- **Intervention B** consisted of ten spellings, using the control condition – writing spellings on a Look, Cover, Write, Check sheet together with a multiple-choice test as 'a learning event'.

There was a wash-out period of one week between each condition to reduce carryover effects (see Churches and Dommett, 2016). At the end of each condition, pupils were tested on the ten words they had learnt through words read in context, as used in the pre-test before the trial began.

### Materials

The researchers selected 30 words from the National Curriculum spelling lists for Years 5 and 6. The words were divided into three groups of ten. Context sentences containing the words were written. Look, Cover, Write, Check sheets and multiple-choice sheets were created for the trial. Three versions of the multiple-choice testing sheets were created so that the pupils saw the words in a different order in each of the three weekly sessions, to try to reduce the risk of pupils simply recalling which word order was correct.



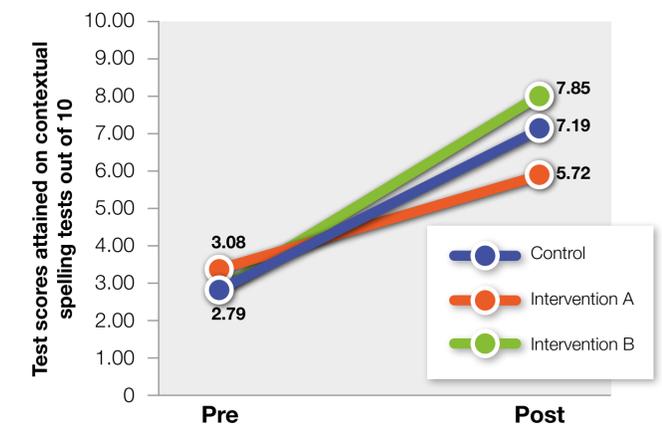
## CONCLUSION

Use of LCWC with the multiple-choice testing method (Intervention B) produced significantly better progress rates during the spelling tests than both the multiple-choice approach (Intervention A) and normal practice (LCWC). It appears that the multiple-choice approach in isolation (Intervention A) has a negative effect on spelling achievement. This may be because the previously identified positive effects of multiple choice alone were in subject areas where children were able to infer associations between new and existing knowledge rather than in the learning of something completely new (as with a previously unseen spelling). In addition, children were also asked which their preferred approach was. Interestingly, despite it being the least effective method in isolation, for increasing pupils' spelling attainment, the most preferred method was multiple-choice testing. 47% of children chose this, in contrast to the other methods: LCWC (11%), both methods together (21%) and no preferred method (22%).

## RESULTS

Gain scores were calculated from pre- and post-test scores in the graph below (Figure 2).

Figure 2: Pre- and post-test spelling test scores for LCWC (Control) compared with Multiple Choice Testing (Intervention A) and both methods (Intervention B)



An initial two-tailed Friedmann's ANOVA indicated that the effect across all three conditions was small but significant ( $W = 0.19, p < .001$ ) and therefore unlikely to be caused by family-wise error. The ANOVA was followed by separate one-tailed Bonferroni adjusted Wilcoxon signed-rank tests (Table 1).

Table 1. Comparisons between the present study conditions<sup>†</sup>

	Control v Intervention A	Control v Intervention B	Intervention A v Intervention B
<b>Effect size (r)</b>	-0.38	0.16	0.51
<b>CI (95%)</b>	-0.50 – 0.24	0.01 – 0.30	0.40 – 0.60
<b>p-value</b>	.015*	.001*	.001*

Testing also differed significantly from novelty ( $p < 0.001$ ) and novelty and testing ( $p < .001$ ) (Figure 2). There were no other significant differences<sup>†</sup>.

\* Significant with alpha = 0.0167

<sup>†</sup> Test identification and analysis were carried out using StatsWizard®.

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