

Practising times tables by singing a times tables song compared to playing a times tables game on an iPad – a preliminary study



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Purpose of the research

Fluency in Mathematics is a key aim of the new Mathematics curriculum. The purpose of the research is to investigate the effectiveness of two different methods for practising times tables.

The research design

A between-subject design was used with a pre- and post-test. The independent variable (type of times tables practice) was operationally defined by creating two counterbalanced conditions:

- IV Level I (Control condition) Times tables game on an iPad
- IV Level II (Experimental condition) Times tables song

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Methods

Participants, sample size and randomisation

Twenty four Year 2 pupils participated in the study. Matched pairing, using the scores from the pre-test, was used to allocate pupils to the control or intervention group.

Procedures

The pupils took part in a ten minutes times tables session every day for five days, either playing a times tables game on an iPad (control) or singing a times tables song (intervention). The post-test took place the day after the final session. Two weeks after the post-test, the pupils took a final test to see how well the knowledge had been retained. The analysis of data looks at the progress from the pre-test to the final test.

Materials (and apparatus)

A test was created with a selection of multiplication and division questions using the three times table. The control group used "Hit the Button"

Results

Two different analyses were conducted.

Analysis A: Progress as measured by an immediate post test

Gain scores were first calculated using the results in the graph below. A Mann-Whitney U test indicated that there was no difference ($p=0.465$ (one-tailed)) between the progress rate of children who learned a times tables song (median gain = 3) compared to playing an iPad game (median gain = 3). The effect size was small and negative ($r=-0.139$).

Analysis B: Progress as measured by a two week delayed post-test (final test)

No difference was detected ($r=-0.029$, $p=0.50$ (one-tailed)).

Figure 1: Pre- and post-test scores for the control and intervention groups

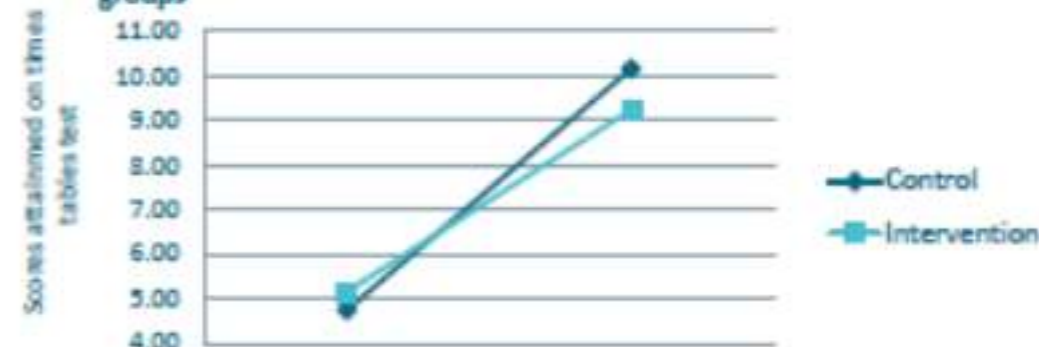


Figure 2: Pre-test scores and final test scores after a two week gap following the intervention for the control and intervention groups



Limitations

The trial was limited by its small sample size and therefore requires replication with greater numbers. It should be acknowledged that the use of simple randomisation may have introduced the risk of between participant variation, which could have affected the results.

Conclusions and recommendations for future research

There was a very small negative effect on the progress of learners in the intervention group. Therefore learning a times tables song does not appear to have greater impact than playing an iPad game. Although no significant differences were found, the delayed effect in progress illustrated within the descriptive statistics might be worth exploring in a future study.