Precision teaching for literacy

Precision Teaching online: does it help children? Does it help schools?

Research summary.

Precision Teaching (PT) is an evidence based intervention that has been widely researched and extensively advocated for use in schools (e.g. Raybould, 1984, Griffin & Murtagh, 2015, Roberts & Norwich 2010). Generally implementation rates are low with only 20-25% of those trained in PT actually going on to use it with children in schools. The barriers to implementing PT are often practical rather than people's intentions to use it (Killerby 2015). Killerby found that obstacles to implementing PT were often related to planning time and physical resources that were available to deliver the intervention.

This study undertaken between University College London and Kent Educational Psychology Service investigated the impact of a web-based PT programme for word level literacy skills on implementation rates and children's word reading. The website allows staff in school to administer the programme. Specific practical elements of the programme that aim to overcome barriers to implementation include;

- A detailed selection of pre-prepared tasks that can be used according to the needs of the child taking part.
- Presentation of the tasks removing the need for staff to produce paper tasks themselves.
- Automatic recording of responses as the child completes an activity with an adult.
- Automatic conversion of data into a fluency chart (a key element in using the PT approach that provides information about the child's rate of learning).

The study had two key research questions;

- What impact does the web-based method of delivering precision teaching have on children's word reading skills and phonemic decoding skills?

- To what extent does the functionality of the web-based precision teaching programme help overcome barriers to implementation of PT?

Impact on children's progress.

10 schools started the research project and of these 7 were able to implement the programme. From these 7 schools 49 children followed the PT programme for 8 weeks or more, with an average of 102 practice sessions per child (at least twice a day on average). Some children started the programme but did not complete enough to meet this minimum threshold for inclusion in the research.

Of these 49 children 15 did not have complete decoding and reading test data that allowed them to be included in the results, meaning that 34 children were included in the final analysis (26 male, 8 female, mean age at the start of the research was 8 years and 8 months, SD 2 years 6 months, ranging from 5 years 11 months to 14 years 8 months) from 6 schools around the UK (1 Secondary and 5 Primary).

Decoding efficiency. The following table shows the mean Test of Word Reading Efficiency (TOWRE) scores for the decoding task (reading non-words) for the 34 children included in the final analysis.

	Mean TOWRE standard score.	Standard Deviation.
Time 1 (Start of baseline)	81.4	11.1
Time 2 (End of 1 month baseline – start of intervention.)	81.2	12.4
Time 3 (End of 10-12 weeks of intervention)	86.8	12.7
Time 4 (2 month Follow up.)	88.5	12.7

Statistical analysis (Repeated measures ANOVA and subsequent T tests) shows that the change in decoding skills between T2 and T3 was statistically significant with an effect size of 0.7.

Before the intervention the children were not making progress with their decoding skills. The decoding scores improved significantly as a result of the intervention. It is important to note that these are group average scores and not all children improved by this amount. Although not all children improved as much as others overall there was an improvement of over 5 standardised points, meaning that children were not only making progress in decoding but were catching their peers up. An upward trend continued after the intervention was stopped with scores at two month follow up being even higher.

Single word reading efficiency. The following table shows the mean TOWRE scores for the single word reading task for the 34 children included in the final analysis.

	Mean TOWRE standard score.	Standard Deviation.
Time 1 (Start of baseline)	81.2	9.1
Time 2 (End of 1 month baseline – start of intervention.)	81.3	10.2
Time 3 (End of 10 weeks of intervention)	85.4	10.1
Time 4 (2 month Follow up.)	85.6	11.5

Statistical analysis (Repeated measures ANOVA and subsequent T tests) shows that the change in single word reading skills between T2 and T3 was statistically significant with an effect size of 0.6.

At baseline before the intervention the children were not making progress with their reading. The reading scores improved significantly as a result of the intervention. It is important to note that these are group average scores and not all children improved by this amount. Although not all children improved as much as others overall there was an improvement of 4 standardised points, meaning that children were not only making progress in decoding but were catching their peers up. Progress was not a great as that seen with decoding.

What was Sound Progress like for staff to use?

Implementation rates and fidelity.

Of the 49 pupils who took part and reached a minimum level of 80% of the 10 week programme (or more) it was possible to see how often they completed tasks. The mean number of tasks completed per pupil was 102. In an 8-10 week programme this meant that generally children completed the tasks twice a day on average, with some as little as once a day and some over three times a day.

There was no difference in implementation rates between schools who reported having used PT before and those who were using it for the first time. 7 schools out of 10 implementing the programme (with a total of 49 children out of a possible 100 participants if all schools had completed it with 10 pupils) compares very favourably with the finding in previous research that only 25% of teachers and teaching assistants trained in PT go on to use it in their work using conventional systems for PT.

Of the 9 staff who completed the questionnaire 7 reported using the fluency charts generated by the website, 2 reported not using them.

Use of online guidance.

Staff responded to questions indicating whether they had used the online guidance. 6 out of the 9 who responded noted that they had watched the recorded introductory presentation and read the online guidance. All felt that this had helped their understanding of the approach and how to use Sound Progress.

Staff perceptions of pupil enjoyment.

Staff using the programme in school were asked to rate to what extent they felt that children enjoyed using the programme on a scale of 1 to 10, with 10 being ‘a lot’ and 1 being ‘not at all’. The mean rating for the 8 ratings completed by staff was 8.2. Several staff commented on the encouraging and fun nature of the website design such as positive feedback like ‘Wooftastic’.

Implementation barriers and facilitators.

Staff were asked to rate how easy the website was to use on a scale of 1 to 10, with 10 being very easy and 1 being not easy. The average rating for the 9 responses was 7.2.

Staff were also asked to report aspects of the programme they liked or that helped them to implement the PT and aspects that they found difficult or problematic and factors that were barriers to implementing PT.

Facilitators	**Barriers**
Clear stages and task progression.	Hardware issues, (buttons were small when using on ipads).
Encouraged an ipsative approach.	Time constraints, Tricky to fit everything in.
Graphs are a great representation of what children are doing.	Difficult to know the correct level to start at.
Giving a dedicated time slot.	Non-standard days, trips, Christmas and timetable in school can make it difficult.
Simple to navigate.	Difficulty logging in to the website.
Easy to access data and helpful in looking at progress.	Staff absence.
The tasks were engaging and quick to do.	Codes rather than pupil names made it tricky.
The progression of the tasks was effective in helping memory for what the children had covered.	

Conclusions.

A web based programme for implementing PT has shown favourable implementation rates and a good level of impact on decoding and word reading skills during a 10 week intervention. The TOWRE is a timed test so results indicate an improvement in automaticity. The elements of PT completed automatically by the website that would normally have to be completed by the adults running the programme (setting up tasks, sequencing tasks, recording performance, charting performance) mean that many of the barriers reported by previous research (time to implement and the resources needed to implement) have been reduced.

The study has a high level of ecological validity and has been conducted in the 'real world' with schools around the UK with minimal support and advice from the research team. A limitation is that despite knowing when tasks were completed and how well children did on each task it is not possible to know whether adults interpreted the instructions with complete accuracy as they delivered the programme.

Although not explored as part of this research project there is also the potential for the data recorded by the website to be available to educational psychologists who work with the school. This could be used to support organisational change, coaching and enabling work that might happen around the implementation of the programme in school (e.g. Roberts & Hampton 2008). Future research could explore combining this new online approach with face to face training and ongoing support for a school by a psychologist who has a good working relationship with that school as a critical friend. This could lead to even higher implementation rates and fidelity for PT.