

Impact on skills and attitudes of SEN pupils: Making literacy links through Touch-type Read and Spell (TTRS)

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London*

In this multi-phase study, an intervention and control group of Year 3, 4, 5 and 6 Special Education Needs (SEN) pupils from a primary school located in inner London were given regular in-school access to a literacy-based touch-typing program. Pre- and post-test measures showed improvements in decoding, sight-reading, and reading comprehension for the intervention group in three of the four phases. Improved spelling skills were also found in the final project phase. Parents and teachers reported marked improvement in pupils' attitudes towards learning, behaviour and ability to concentrate, along with boosts in self-esteem and self-confidence. Results are discussed in the context of phonics-based interventions and the impact of teaching typing skills to support confidence and improve attitudes towards learning in SEN students.

Introduction

Touch-type Read and Spell (TTRS) is a multi-sensory computer-based typing course that uses word lists and sentences based on Hornsby and Shear's Phonological Model (1974) and the literacy curriculum *Alpha to Omega* (Hornsby, Shear & Pool, 1999), to develop phonetic awareness and literacy skills in learners. The main course consists of 24 Levels of 31 Modules each that focus on helping students link sounds to symbols through repeated exposure to spoken and written word forms. When students complete a module, they hear applause commensurate with performance and see both their accuracy score and Words Per Minute (WPM) typing speed displayed on screen. They are also shown a graph that compares their typing performance across modules. TTRS can be delivered on a desktop or laptop computer, or a tablet device paired with a keyboard. It can be used independently by students or taught via guided tuition for learners aged 7+.

Participants

The study consisted of 44 Special Education Needs (SEN) pupils with various learning difficulties, including dyslexia, randomly chosen from Year 3, 4, 5 and 6 classes at St. Augustine's Primary School.

Procedure

Four groups of 11 pupils participated in twice-weekly 30-minute typing sessions using TTRS in the school's computer suite during their lunch breaks. The study took place across four terms from September 2006 to December 2007. Literacy tests were delivered to control and intervention groups before and after the intervention.* Students, parents and teachers completed surveys at the start and end of each term.

Instruments

The Comprehension Suffolk Reading Scale 2 (SRS-2; Hagley, 2002) and the Reading and Spelling Wide Range Achievement Test (WRAT-3; Wilkinson, 1993) were used for literacy measures. Additional data was collected via surveys written by the researcher and delivered to pupils, parents, and teachers.

Results

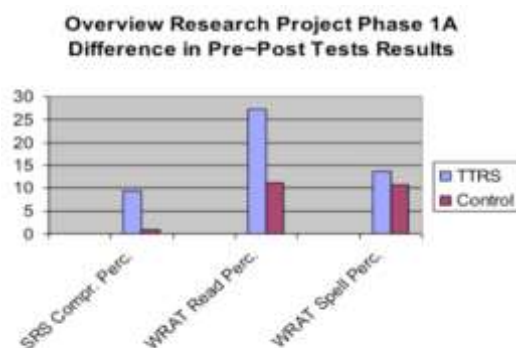
The Touch-type Read and Spell (TTRS) intervention group outperformed the control group in measures of decoding in all project phases, see **Figures 1.1-1.4**. The intervention group also showed higher improvement on comprehension measures in Phases 1A, 2A, and 2B. A difference in spelling performance was found for the WRAT-3 Spelling test in Phase 2B, with the intervention group outperforming the control group.

**Control groups were given access to the TTRS program in the term following the intervention to ensure they received the same benefits as the intervention group*

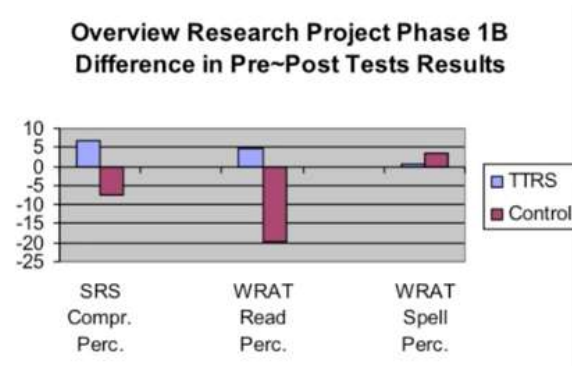
Figures 1.1-1.4

Intervention Vs Control Group Performance Gains On Post-Tests, Phases 1A, 1B, 2A, 2B

1.1

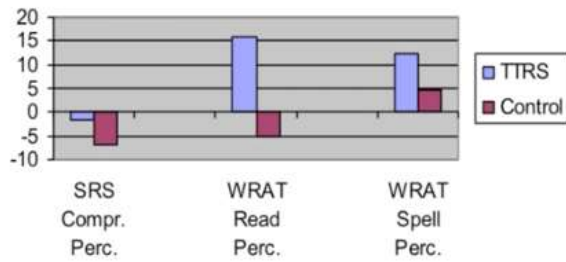


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Overview Research Project Phase 2A Difference in Pre~Post Tests Results



1.4

Overview Phase 2B Percentile Difference in Pre~Post Tests Results

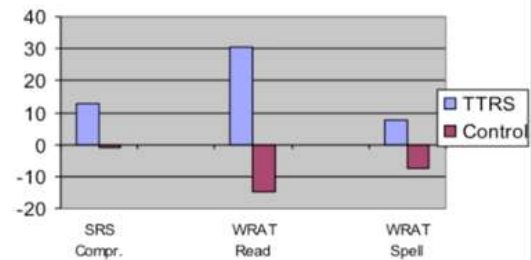


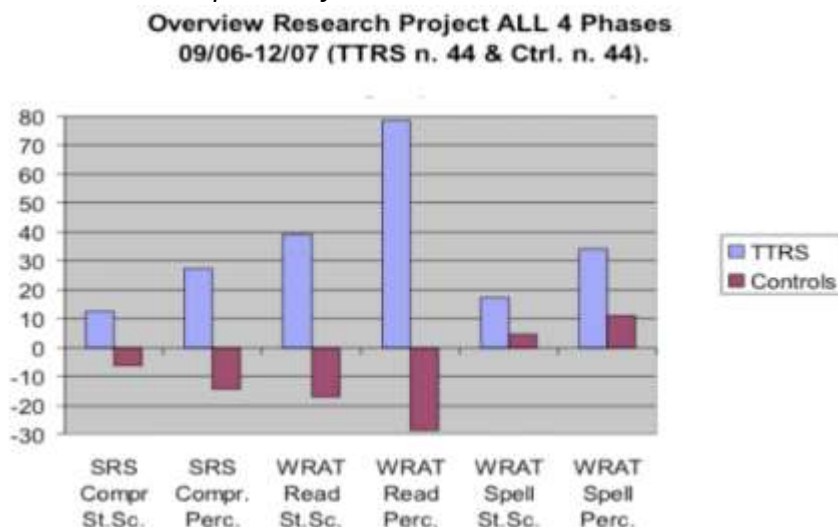
Table 1.1

Average Pre And Post Literacy Test Performance Gains

Phase 1A (9/06-12/06)						
Measure	SRS Comprehension		WRAT Reading		WRAT Spelling	
	Standard	Percentile	Standard	Percentile	Standard	Percentile
Intervention (N=11)	+3.4	+9.3	+14.8	+27.3	+6.5	+13.6
Control (N=11)	+0.6	+1	+5.1	+11.3	+4.4	+10.7
Phase 1B (1/07-3/07)						
Measure	SRS Comprehension		WRAT Reading		WRAT Spelling	
	Standard	Percentile	Standard	Percentile	Standard	Percentile
Intervention (N=11)	+4.2	+6.9	+1.6	+4.9	+1.8	+0.6
Control (N=11)	-3.5	-7.7	-13.4	-19.9	+1.8	+3.4
Phase 2A (4/07-7/07)						
Measure	SRS Comprehension		WRAT Reading		WRAT Spelling	
	Standard	Percentile	Standard	Percentile	Standard	Percentile
Intervention (N=11)	-0.5	-1.5	+6.6	+4.7	+1.8	+12.3
Control (N=11)	-3.2	-7	-5	+1.6	+1.8	+4.5
Phase 2B (9/07-12/07)						
Measure	SRS Comprehension		WRAT Reading		WRAT Spelling	
	Standard	Percentile	Standard	Percentile	Standard	Percentile
Intervention (N=11)	+5.3	+12.7	+16.3	+30.5	+4.2	+7.6
Control (N=11)	-1.08	-8	-5.9	-15	-3.3	-7.6

Figure 1.5

Combined Participant Performance Across All Phases



Student survey results

Self-report survey results were collected for 30 of the 44 participants. Results showed pupils felt they had increased their reading, writing and concentration skills after completing the TTRS intervention, see **Figure 1.6**. They reported higher attitude towards learning, increased self-confidence, better social skills and improved behaviour.

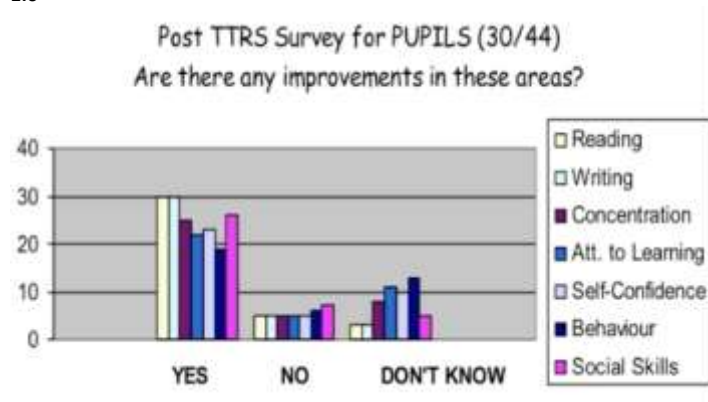
Parent survey results

Of the 44 participants, 21 parents returned surveys. Parent responses indicated a perceived increase in their child's reading and writing skills, ability to concentrate, attitude towards learning, self-confidence, behaviour and social skills following use of TTRS, see **Figure 1.7**.

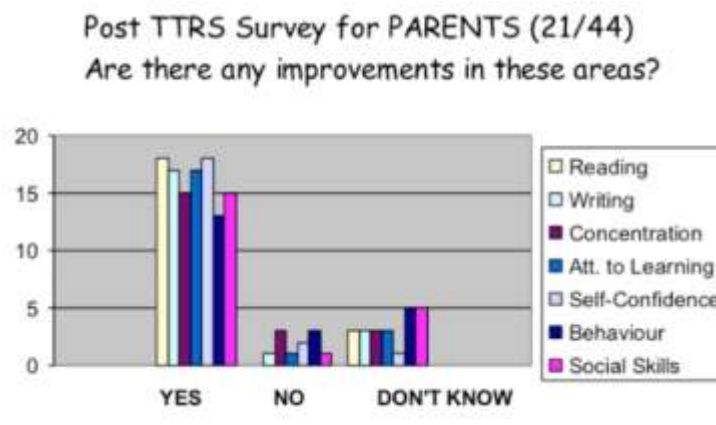
Figures 1.6 - 1.7

Pupil and Parent Pre And Post Intervention Self-Assessment Of Literacy And Attitudes Survey Results

1.6



1.7

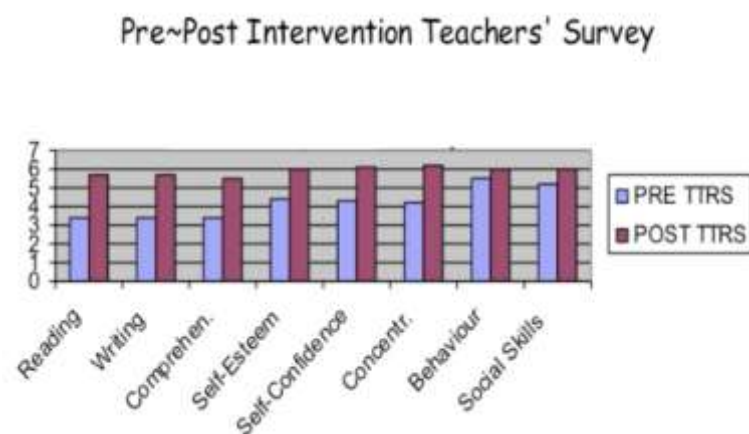


Teacher survey results

For each participating pupil, teachers completed a separate pre and post intervention survey. They reported gains for pupils in all areas, including decoding, reading comprehension and writing skills, self-esteem and confidence, ability to concentrate, ability to regulate behaviour and social skills, see **Figure 1.8**.

Figure 1.8

Pre And Post Intervention Teacher Survey Results



Discussion

Decoding requires an ability to effectively pair letters and letter groups with sounds and is an essential first step towards comprehension in reading. Some learners, especially those who struggle with dyslexia, can have poor phonemic awareness and may struggle to split words into their component sounds. This can impact decoding and spelling and can have a knock-on effect for comprehension, which may lead to reading becoming both a cognitively exhausting and frustrating experience.

Results in this study showed decoding was the literacy skill most impacted by the TTRS intervention. Participants made significant gains compared to a control group in their ability to accurately read words aloud. The improved performance of the intervention group, in addition to self-reports of perceived greater ability in reading and comprehension, suggests the program may have provided effective phonics support and addressed a fundamental skill underpinning reading ability.

In the TTRS Course, users are repeatedly shown a word's written form, as they are played an audio of its spoken form and asked to type the word in typing modules. This helps to establish phoneme-grapheme mapping. Words with similar phonemic patterns are presented together in groups, which further strengthens sound-letter links and reinforces learning.

Content is also organised according to a phonics-based curriculum, beginning with short vowel CVC words in Level 1 and progressing to cover common di and trigraphs in Levels 2, 3 and 4 (e.g. Modules teach words with *nd, nt, dr, gr, gl, fl sl, pl, cl, sh, sk, st, tr, mp, ch* and *ng* in Level 2, and words with *nk, st, lk, lt, ft, th, sm, sn, pr, fr, br, xt, ex, str, scr, lm, sw, qu, nx* and *ar* in Level 3). Students are given the option to use dyslexia-friendly fonts to display words on screen, choose a male or female voice for the audio component, select enlarged text formats and set appropriate background and text colours to enhance contrast and facilitate visual processing. Together these factors may have helped to further solidify sound-letter links as participants worked their way through the TTRS typing modules.

Improvements in reading comprehension following the intervention and a greater performance in spelling measures in Phase 2B of the study were also recorded. Decoding in reading is a receptive skill. Receptive skills tend to develop ahead of productive skills, which may explain why reading results were more visible than spelling gains. Another explanation is the limited scope of the project. Participants used the program for an average of 12 hours per term and most were only able to complete the first three levels. The TTRS Main Course contains 24 Levels with common English spelling patterns taught in Levels 4-24, once all of the keys on the keyboard have been introduced. A longer study may thus be required to see greater results and enhanced performance in spelling.

When it comes to the impact of learning to touch-type on attitudes towards learning, we can see teachers reporting benefits across all measures, in particular self-confidence, self-esteem and ability to concentrate. On average participants in this study completed 4-5 modules in each 30-minute typing session. They experienced increases in WPM (typing speed) and accuracy but also demonstrated enhanced ICT awareness and confidence on the computer. Teachers noted pupils were more motivated to practise typing as their keyboarding skills improved.

One key feature of the TTRS Course is its modular approach. Learning is broken down into small steps and pupils proceed through the content at their own pace, repeating any module where they scored 80% or lower for accuracy, and earning a base level of applause, with greater praise for higher scores. Following module completion, they are also shown their performance on a graph so they can see both how much they have done and how well they're doing. This step-by-step approach may have contributed to the overall gains reported by teachers, parents and the pupils themselves in confidence and self-esteem.

One teacher noted some students recorded module success on a progress card, in addition to regularly printing out certificates from the program for their achievements. This may have provided a Feel Good Factor (FGF) to the intervention, which SEN students can sometimes lack, given lower average performance compared to peers. Survey findings suggest literacy-based typing can provide underperforming students with an opportunity to excel and achieve results that make them feel proud of their skills and ability.

It's also interesting to note the results regarding an improved ability to concentrate following the TTRS intervention. TTRS is often used for students who struggle with attention disorders and may find the distracting and flashy advertisements in the margins of many free online typing programs distracting. The TTRS interface was designed with SEN students in mind. It is streamlined so the pupils are able to get right back to their last completed module when they first sign in.

Conclusion

This study showed Special Education Needs (SEN) pupils from Years 3, 4, 5 and 6 experienced literacy skill gains, in particular an increase in decoding ability in reading and comprehension performance, after approximately 12 hours (1 term) of use of the typing program Touch-type Read and Spell (TTRS). Given that many SEN learners struggle with phonemic awareness, these improvements may be attributed to the underlying phonics curriculum of the program and its multi-sensory delivery mode.

Some spelling improvements were also noted, and gains were reported by teachers, parents and pupils for metrics of self-confidence, ability to concentrate, ability to regulate behaviour, social skills and perceived reading, writing and comprehension skills. Ideally, future studies will extend beyond a single term and run for an entire school year which may help to further probe the program's impact on spelling skills.

The researcher notes the importance of teachers maintaining a non-competitive approach in TTRS delivery and allowing each SEN pupil to work at his or her own pace. Teachers should also consistently praise pupils for meeting usage, not just performance, goals.

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